
START 3

Superfund Technical Assessment and Response Team 3 –
Region 8



United States
Environmental Protection Agency
Contract No. EP-W-05-050

ANALYTICAL RESULTS REPORT for SITE REASSESSMENT

**UPPER ANIMAS MINING DISTRICT
Silverton, San Juan County, Colorado**

APPENDICES

TDD No. 1008-13

August 10, 2011



URS
OPERATING SERVICES, INC.

In association with:

TechLaw, Inc.
LT Environmental, Inc.
TN & Associates, Inc.
Garry Struthers Associates, Inc.

000081

APPENDIX A

Sampling Activities Trip Report (Includes Project Photolog)

URS OPERATING SERVICES

1099 18TH STREET
SUITE 710
DENVER, COLORADO 80202-1908
TEL: (303) 291-8200
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January 10, 2011

Ms. Sabrina Forrest
U.S. Environmental Protection Agency, Region 8
Mail Code: 8EPR-B
1595 Wynkoop Street
Denver, Colorado 80202-1129

**SUBJECT: START 3, EPA Region 8, Contract No. EP-W-05-050, TDD No. 1008-13
Trip Report, Upper Animas Mining District, Silverton, San Juan County, Colorado**

Dear Ms. Forrest:

Attached is one copy of the trip report for sampling activities conducted for the Upper Animas Mining District Site Reassessment. Activities included surface water, sediment, and soil sampling. Field activities were conducted from October 25, 2010 through November 1, 2010. This document is submitted for your approval.

If you have any questions, please call me at 303-291-8264.

Sincerely,

URS OPERATING SERVICES, INC.

Megan Dudevoir
Project Manager

cc: Charles W. Baker/UOS (w/o attachment)
File/UOS

EPA ACTION BLOCK

- ☐ Approved
- ☐ Approved, TDD to follow
- ☐ Approved as corrected
- ☐ Disapproved
- ☐ Review with _____
- ☐ Original to _____
- ☐ Copy to _____
- ☐ Reply envelope enclosed

Date By

TRIP REPORT
Upper Animas Mining District
Silverton, San Juan County, Colorado

1.0 INTRODUCTION

URS Operating Services, Inc. (UOS), was tasked by the Environmental Protection Agency (EPA), under the Superfund Technical Assessment and Response Team 3 (START) contract # EP-W-05-050 Technical Direction Document (TDD) No. 1008-13, to conduct a site reassessment (SR) at the Upper Animas Mining District site. Specifically, START was tasked to collect as many as 69 surface water samples, 61 sediment samples, and 36 source soil samples, including QA/QC samples. Field activities were completed in accordance with the approved Field Sampling Plan (FSP) (UOS 2010). During the field sampling event 54 surface water samples, 54 sediment samples, and 14 source soil samples were collected; these sample numbers include field duplicate samples.

The site is located in Silverton, San Juan County, Colorado and is made up of publically and privately owned parcels. The investigation focused on the Animas River between U.S. Geological Survey (USGS) gauging stations A72 and A68, Mineral Creek immediately upstream of the Animas River, Cement Creek, and tributaries to Cement Creek (Figure 1) (UOS 2010).

Site activities were conducted from October 25, 2010 through November 1, 2010 and included sample collection along with photo documentation, GPS documentation, and in situ water parameter collection. All water samples were submitted to the EPA Region 8 Environmental Services Assistance Team (ESAT) laboratory for Target Analyte List (TAL) metals analysis. Additionally, sediment samples were submitted to a Contract Laboratory Program (CLP) laboratory for TAL metals and poly-chlorinated biphenyl (PCB) analysis.

2.0 BACKGROUND

Mines in the Silverton area operated between the years 1874 and 1991. Mining activities in the Upper Animas basin, including Cement Creek, produced the waste rock and mill tailings sources from which contamination spread throughout the surface water pathway. This site assessment focused on Cement Creek, a major source of metals contamination to the Animas River.

Thirty-three individual sources of mine wastes have been identified in the Cement Creek drainage, totaling approximately 188,000 cubic yards (UOS 2009). Several investigations have been conducted in the Cement Creek basin by the Colorado Department of Public Health and the Environment (CDPHE),

but data were not appropriate for evaluating the site based on HRS criteria. Several sources of mine waste have been reclaimed to some degree through work carried out by the Bureau of Land Management (BLM), the CDPHE, the Colorado Division of Reclamation Mining and Safety (DRMS), and the Animas River Stakeholders Group (ARSG). The reclaimed waste areas are primarily in gulches that feed into lower Cement Creek. Most of the sources of mine wastes in the Upper Cement Creek basin remain in place. The wastes are rich in arsenic, cadmium, copper, lead, manganese, and zinc.

During the October 2010 sampling event, START aimed to characterize the impact of most tributaries on Cement Creek, and the impact of Cement Creek on the Animas River.

The purpose of this SR sampling event was to assist the Region 8 EPA in gathering data to determine whether this site should be considered for National Priority List (NPL) listing.

3.0 SITE ACTIVITIES

START members Megan Dudevoir, Bryan Williams, Andrew Longworth, and Nathan Williams mobilized to the site on October 25, 2010. START members collected 50 surface water samples, 54 sediment samples, 14 soil samples, and 4 adit water samples over the course of 8 days. The location of each sample was documented by collecting a GPS point. All sample locations, parameters, collection time, and collection date were entered into a site database. Sample containers were labeled, placed in coolers with ice, and kept under chain of custody. In the first 2 days of sampling, October 25 and 26, 2010, the temperatures were below freezing for the entire day, and snow fell throughout the day. In the higher elevations, as much as 1.5 feet of snow fell. In the remaining days of the field event, mid-day temperatures exceeded 32 degrees and START observed snow melt running into Cement Creek and its tributaries.

Site photos are provided in Appendix A.

4.0 SAMPLING AND ANALYSIS

Samples were collected in accordance with the approved FSP, with exceptions and justifications noted in Section 5.0 of this report. START personnel collected three duplicate and Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples for water and soil/sediment. Duplicate and MS/MSD samples were collected for samples UASW005, UASE005, UASW019, UASE019, UASW035, and UASE035. Surface water samples were hand-delivered to the EPA Region 8 ESAT Laboratory located in Golden, Colorado,

on November 2, 2010. Sediment and soil samples for PCB and total metals analysis were shipped via FedEx to the following CLP laboratory on November 2, 2010:

ALS Laboratory Group
960 West LeVoy Drive
Salt Lake City, Utah, 84123

Samples were received in good condition with custody seals intact. Approximate sample locations are illustrated in Figures 2 and 3 of the approved FSP.

4.1 SOIL SAMPLING

Soil samples were collected for total metals and PCB analysis. All of the soil samples were source samples and were collected in accordance with procedures described in UOS TSOP 4.16, "Surface and Shallow Depth Soil Sampling" (UOS 2005). Dedicated, disposable plastic scoops were used for source sample collection. All source samples were collected as biased grab samples from the 6- to 12-inch depth interval, with the exception of UASO001 and UASO002, which are described in Section 5.0 of this report. A sharp shooter shovel was used to accomplish the depth needed for the sample and was decontaminated between samples. Soil samples for total metals analysis were placed in 8-ounce high density polyethylene (HDPE) jars. Soil samples for PCB analysis were placed in 8-ounce amber glass jars. All samples were labeled with the sample identification number and stored in a cooler on ice pending shipping to the laboratory. Sample descriptions were logged in the field log book. A GPS point and photograph were collected for each sample location.

4.2 SURFACE WATER SAMPLING

Surface water samples (including adit water) were collected for total and dissolved metals analysis. Surface water sampling for total metals was conducted by facing upstream and immersing the 500 mL HDPE sample bottle directly into the sample media. Surface water sampling for dissolved metals was conducted by immersing a length of HDPE tubing in the sample media. Water was drawn through a 0.45 micron filter and into the 500 mL HDPE sample bottle using a peristaltic pump. Sample bottles and filters were certified pre-cleaned by the provider, and water was drawn through the tubing and discarded prior to sample collection to ensure contamination was not introduced by sampling supplies. Samples were preserved with nitric acid. UOS measured field parameters, including pH, temperature, and electrical

conductivity, of each sample. Field instrumentation was calibrated daily, and all calibration and field data was recorded in the field log book. Sampling was conducted from the farthest downstream location to the farthest upstream location to minimize the potential for cross-contamination. All surface water sample locations were photographed, recorded with GPS, and documented in the field log book during sampling activities.

4.3 SEDIMENT SAMPLING

Sediment samples were collected for total metals and PCB analysis. Sediment sampling was conducted according to UOS TSOP 4.17, "Sediment Sampling" (UOS 2005). Sediment sampling locations corresponded to surface water sampling locations and were collected immediately after the surface water sample was collected, proceeding from the most downstream location to the most upstream location. START attempted to collect primarily fines and avoid gravel, but in some locations fines were not readily available, and the sample contained some larger grains or gravel. Sediment samples were collected using a disposable, dedicated scoop. Total metal samples were placed into 8-ounce HDPE jars, and PCB samples were placed in 8-ounce amber glass jars. Sediment samples were labeled and stored in a cooler on ice pending shipping to the laboratory. All sediment sample locations were photographed, recorded with GPS, and documented in the project log book during sample activities.

5.0 FIELD SAMPLING PLAN DEVIATIONS

The following deviations from the FSP were made in the field based on assessments made by the START project manager and field team members:

- Samples UASW038 and UASE038 (Illinois Gulch) were not collected because the confluence of Illinois Gulch and Cement Creek was located on private property for which START did not have an access agreement.
- Samples UASW048 and UASE048 (Elk Tunnel discharge) were not collected because START personnel could not identify any flow from Elk Tunnel.
- Samples UASW051 and UASE051 (Mammoth Tunnel discharge) were not collected because START personnel could not identify any flow from Mammoth Tunnel.

- Samples UASW053 and UASE053 (Cement Creek downstream of Prospect Gulch) were not collected because they were located on private property for which START did not have an access agreement.
- Samples UASW055 and UASE055 (Cement Creek upstream of Prospect Gulch) were not collected because they were located on private property for which START did not have an access agreement.
- Samples UASW057 and UASE057 (Dry Gulch discharge) were not collected because START personnel could not identify any flow from Dry Gulch.
- The planned location for samples UASW011 and UASE011 was below all of the Gold King 7 Level waste piles. These samples were instead collected where runoff from the upper piles crosses the mine access road. The planned location could not be safely accessed at the toe of the lower piles due to an extremely steep slope, loose material, and snow.
- In addition to adit water, sediment samples were collected from adit discharge points, as START determined it would provide additional information.
- Fewer soil samples than planned were collected. START personnel dug below snow in several locations on each pile and performed XRF analysis of the driest soil in the hole. In-situ XRF analysis showed waste piles were more homogeneous than expected, so the number of samples required for characterization was reduced. Sample location identification numbers for soil samples were changed in the field to number them sequentially as they were collected. Soil sample identifications are as follows
 - UASO01: American Tunnel
 - UASO02: American Tunnel
 - UASO03: Red and Bonita Mine – top pile
 - UASO04: Red and Bonita Mine – middle pile
 - UASO05: Red and Bonita Mine – bottom pile
 - UASO06: Mogul North Mine waste pile
 - UASO07: Grand Mogul stope – west side
 - UASO08: Grand Mogul stope – east side

- UASO09: Grand Mogul Mine waste piles – east side
 - UASO10: Grand Mogul Mine waste piles – center
 - UASO11: Grand Mogul Mine waste piles – west side
 - UASO12: Mogul Mine waste piles – west side
 - UASO13: Mogul Mine waste piles – adjacent to shed
 - UASO14: Mogul Mine waste piles – east side
-
- Soil samples collected in the vicinity of the American Tunnel, UASO001 and UASO002, were obtained from 0 to 1 inch because the ground was frozen and the planned depth of 6 inches could not be obtained.
 - Soil samples were not collected at the Gold King 7 Level Mine because the waste piles for which START had an access agreement could not be accessed due to unsafe conditions, including extremely steep slope, loose waste rock material, and snow.
 - A sediment sample for PCB analysis was not collected at UASE059 (at the toe of Grand Mogul Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
 - A sediment sample for PCB analysis was not collected at UASE012 (above Gold King 7 Level Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
 - A sediment sample for PCB analysis was not collected at UASE030 (Cement Creek upstream of Grand Mogul Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
 - Sample AD005 was not collected because there is no adit discharge from Grand Mogul Mine.
 - Surface water and sediment samples were not collected at locations 025, 026, 027, 028, and 031 because START was not able to reach the highest elevations due to snowy and potentially unsafe conditions.
 - Soil samples were not collected from the Queen Anne Mine, the Adelphin Mine, and the Columbia Mine because START was not able to reach the highest elevations due to snowy and potentially unsafe conditions.

6.0 LIST OF REFERENCES

URS Operating Services, Inc. (UOS). 2005. "Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA Region 8."

URS Operating Services, Inc. (UOS). 2009. "Data Gap Analysis Report for Targeted National Priority Listing: Upper Animas Mining District San Juan County Colorado." October 13, 2009.

URS Operating Services, Inc. (UOS). 2010. "Field Sampling Plan: Upper Animas Mining District San Juan County Colorado." October 21, 2010.

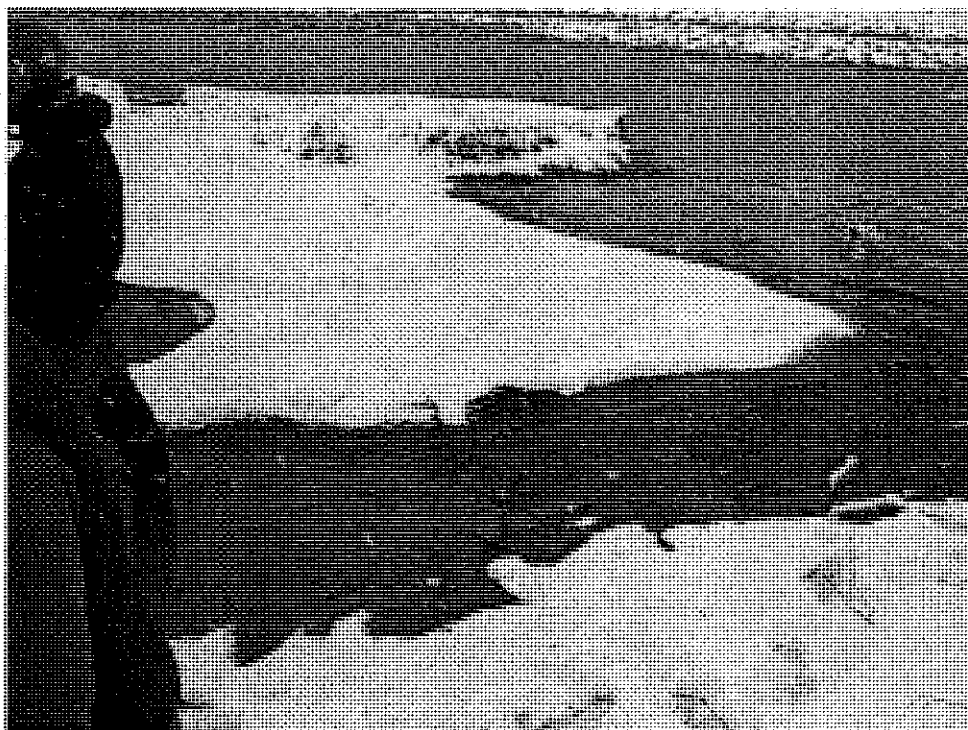


Photo 1
Collection of UASW029 and UASE029 (Animas River downstream of Silverton).



Photo 2
Collection of UASW032 and UASE032 (Animas River downstream of Mineral Creek).



Photo 3
Collection of UASW034 and UASE034 (Animas River upstream of Mineral Creek).

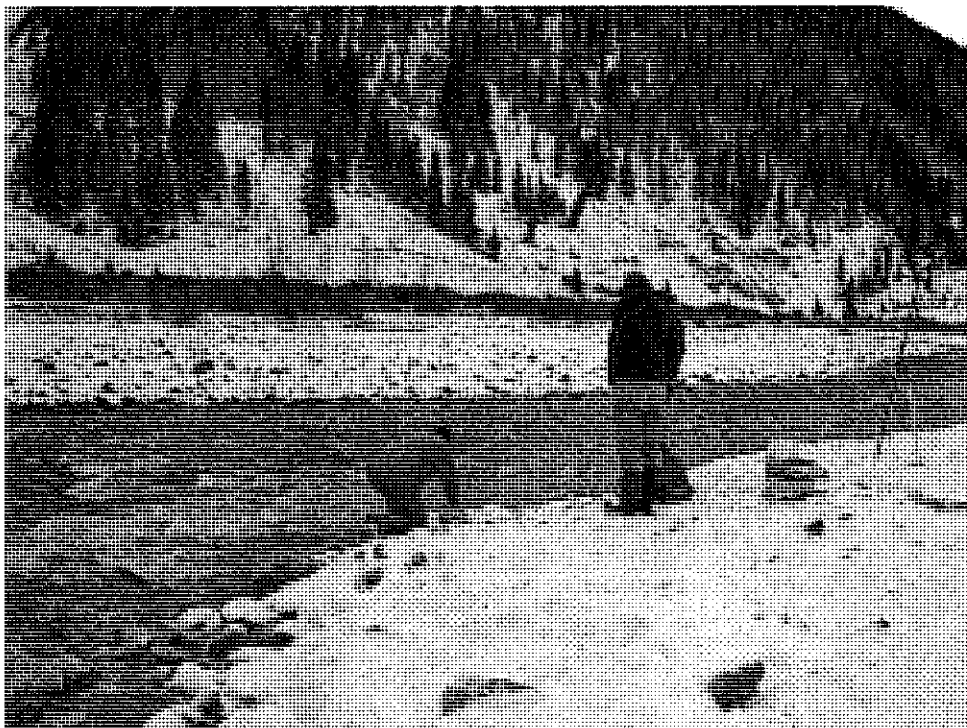


Photo 4
Collection of UASW001 and UASE001 (Animas River downstream of Cement Creek).



Photo 5

Collection of UASW002 and UASE002 (Cement Creek upstream of Animas River).



Photo 6

Collection of UASW003 and UASE003 (Animas River upstream of Cement Creek).



Photo 7

Collection of UASW035 and UASE035 (Cement Creek downstream of Kendrick Smelter).

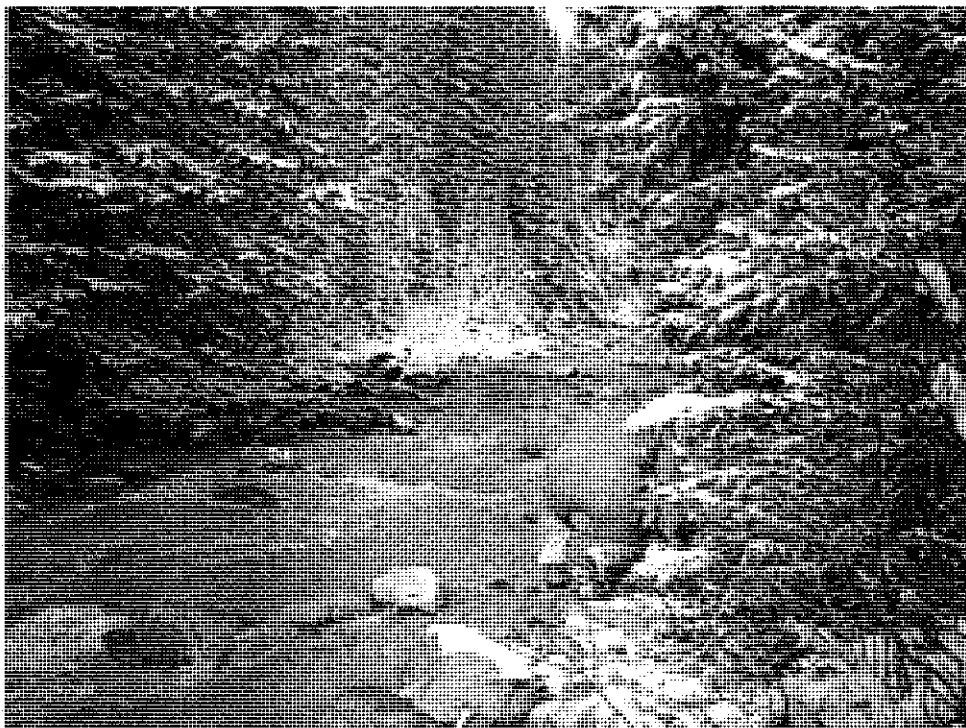


Photo 8

Collection of UASW036 and UASE036 (Cement Creek upstream of Kendrick Smelter).



Photo 9

Collection of UASW037 and UASE037 (Cement Creek downstream of Illinois Gulch).



Photo 10

Collection of UASW039 and UASE039 (Cement Creek upstream of Illinois Gulch, and downstream of Ohio Gulch).



Photo 11
Location of UASW040 and UASE040 (Ohio Gulch discharge).



Photo 12
Collection of UASW041 and UASE041 (Cement Creek upstream of Ohio Gulch).



Photo 13

Collection of UASW042 and UASE042 (Cement Creek downstream of Anglo Saxon Mine).



Photo 14

Collection of UASW044 and UASE044 (Cement Creek upstream of Anglo Saxon Mine and downstream of Minnesota Gulch).

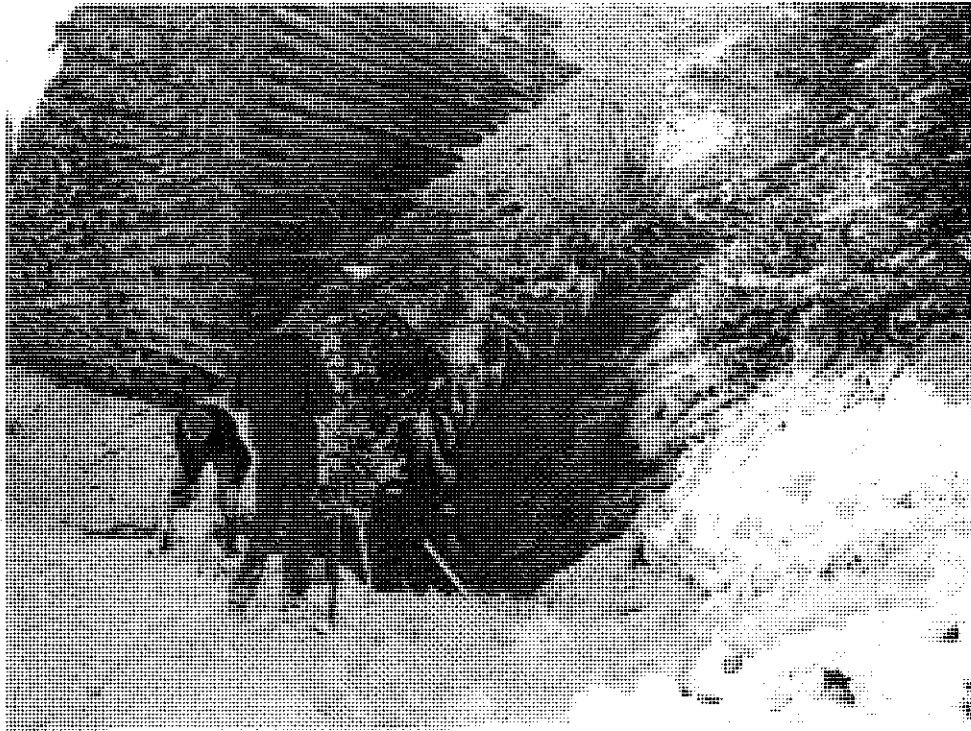


Photo 15
Collection of UASW043 and UASE043 (discharge from Anglo Saxon Mine).



Photo 16
Collection of UASW045 and UASE045 (discharge from Minnesota Gulch).

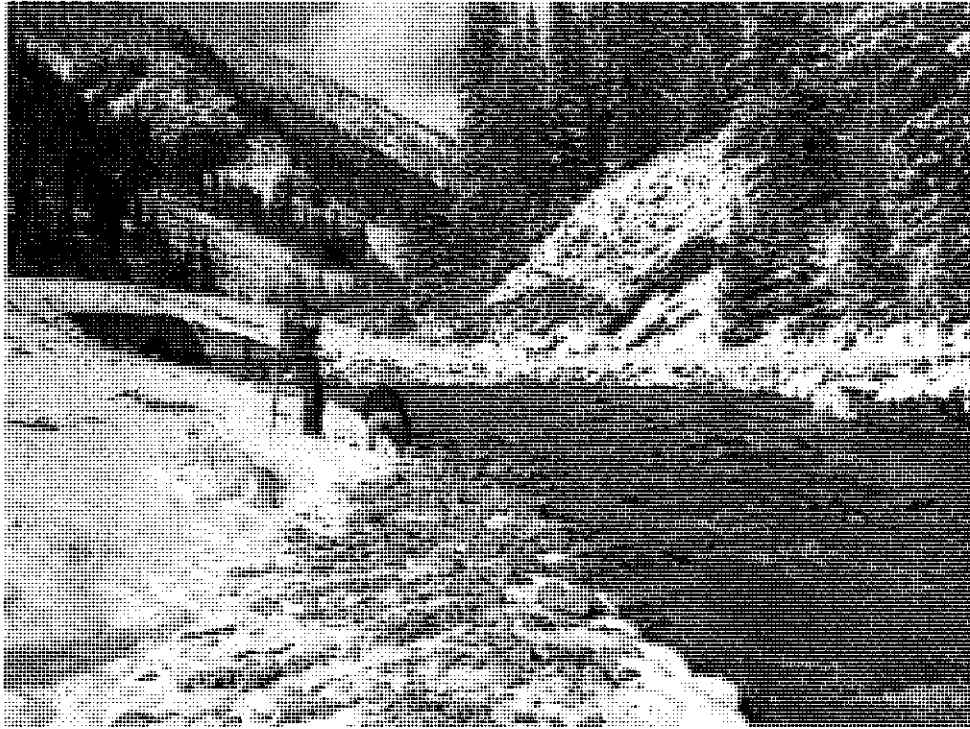


Photo 17
Collection of UASW046 and UASE046 (Cement Creek upstream of Minnesota Gulch).

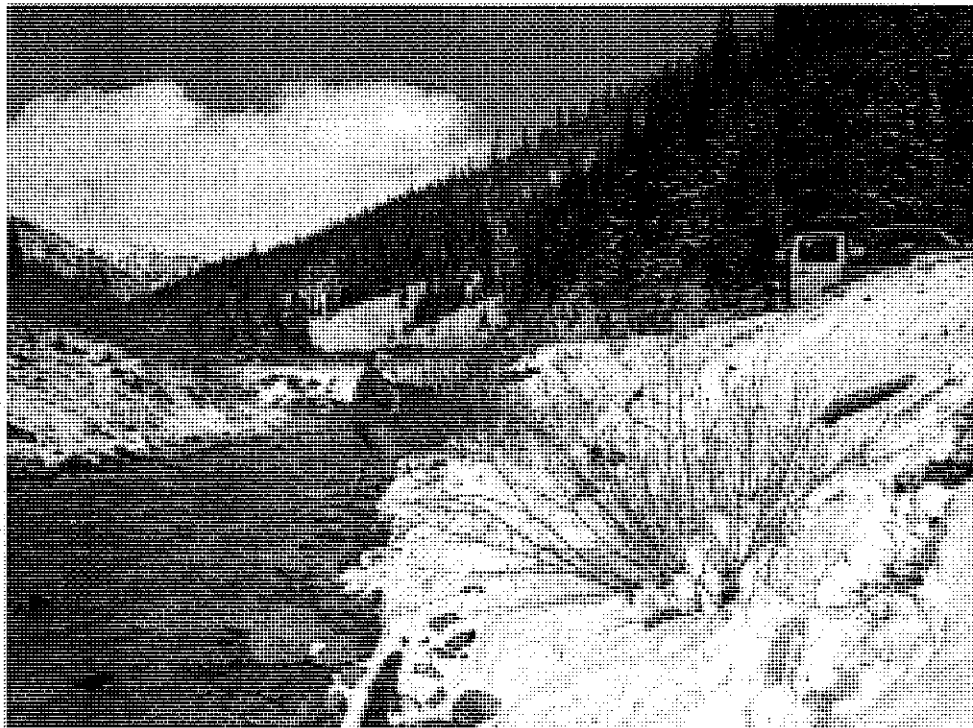


Photo 18
Collection of UASW047 and UASE047 (Cement Creek downstream of Elk Tunnel and Fairview Gulch).

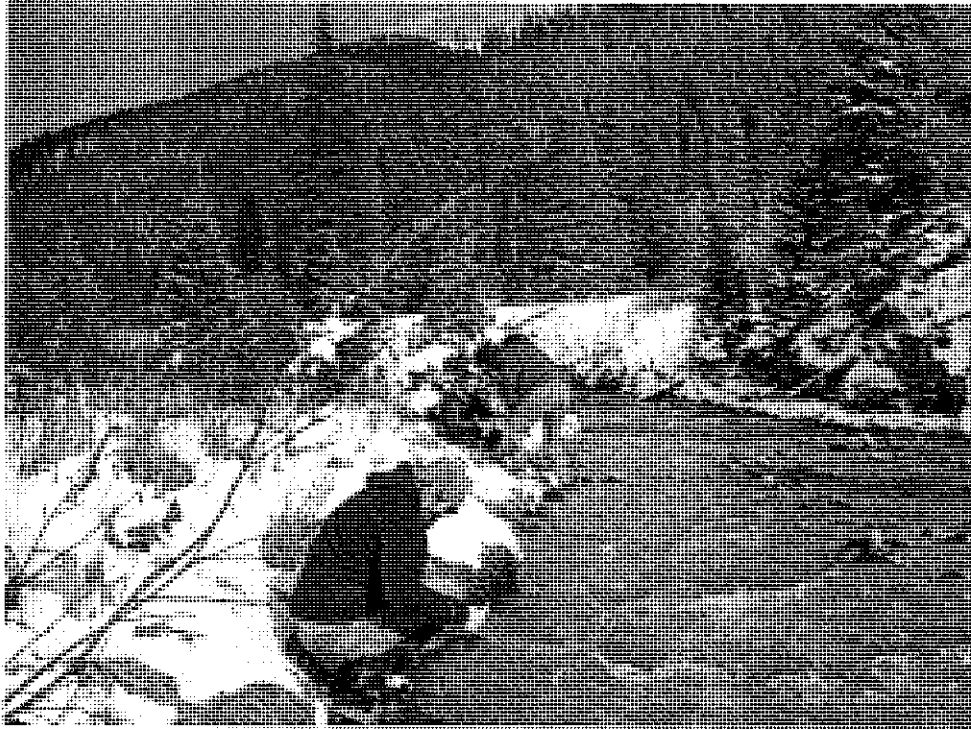


Photo 19

Collection of UASW049 and UASE049 (Cement Creek downstream of Georgia Gulch).



Photo 20

Collection of UASW050 and UASE050 (Cement Creek upstream of Georgia Gulch).

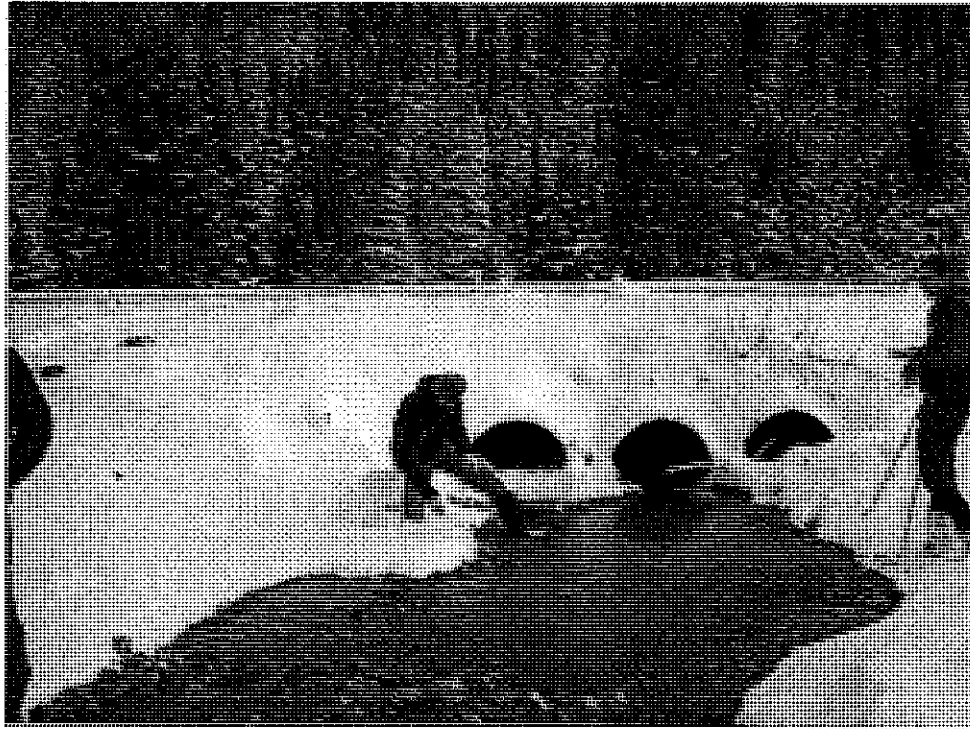


Photo 21
Collection of UASW054 and UASE054 (discharge from Prospect Gulch).



Photo 22
Collection of UASW056 and UASE056 (Cement Creek downstream of Dry Gulch).



Photo 23

Collection of UASW058 and UASE058 (Cement Creek upstream of Dry Gulch).



Photo 24

Collection of UASW004 and UASE004 (Cement Creek downstream of the confluence with the south fork of Cement Creek).



Photo 25

Collection of UASW006 and UASE006 (Cement Creek upstream of the confluence with the south fork of Cement Creek).



Photo 26

Collection of UASW005 and UASE005 (south fork of Cement Creek).



Photo 27

Collection of UASW007 and UASE007 (American Tunnel discharge, immediately upstream of Cement Creek).



Photo 28

Collection of UAAD001 (discharge from the American Tunnel).



Photo 29
Collection of UASW008 and UASE008 (Cement Creek upstream of the American Tunnel).



Photo 30
Collection of UASW009 and UASE009 (Cement Creek downstream of the confluence with the north fork of Cement Creek).



Photo 31
Collection of UASW013 and UASE013 (Cement Creek upstream of the confluence with the north fork of Cement Creek).

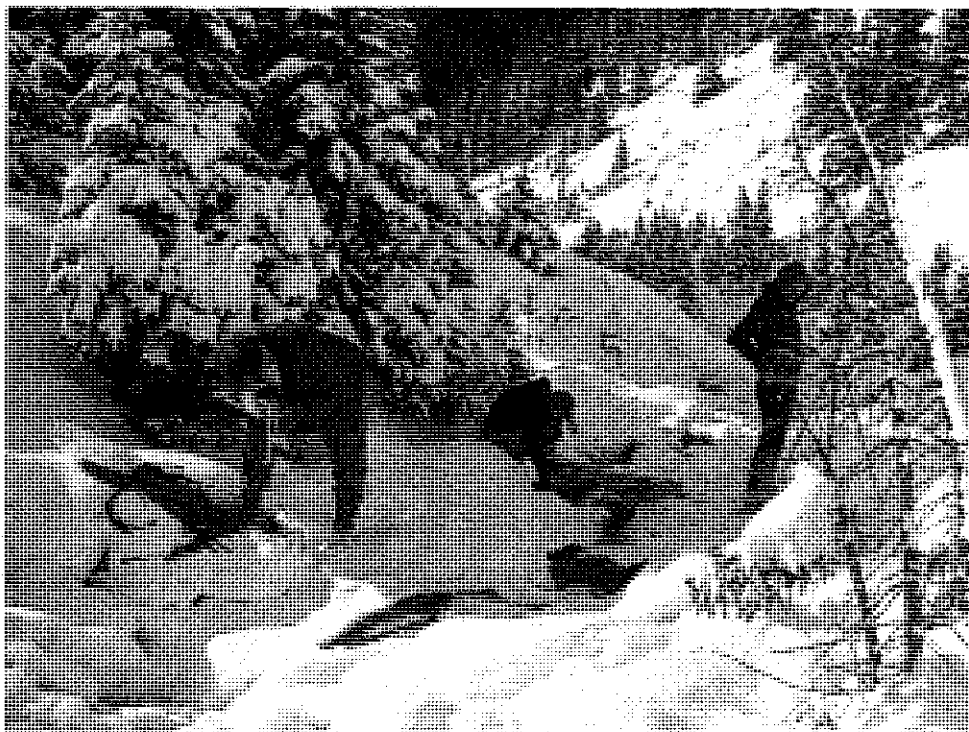


Photo 32
Collection of UASW010 and UASE010 (north fork of Cement Creek).



Photo 33

Collection of UASW014 and UASE014 (Cement Creek downstream of Red and Bonita Mine).



Photo 34

Collection of UASW015 and UASE015 (roadside channel below Red and Bonita Mine).



Photo 35
Collection of UAAD003 and UAAD003 (Red and Bonita Mine adit).



Photo 36
Collection of UASW016 and UASE016 (Cement Creek upstream of Red and Bonita Mine).



Photo 37
North fork of Cement Creek – flow is low and area is mostly frozen over.



Photo 38
Collection of UAAD002 (Gold King 7 Level adit).



Photo 39

Collection of UASW011 and UASE011 (north fork of Cement Creek downstream of Gold King 7 Level Mine – at road crossing).



Photo 40

Collection of UASW012 and UASE012 (north fork of Cement Creek upstream of Gold King 7 Level Mine).



Photo 41

Location of UASW017 and UASE017 (Cement Creek downstream of Mogul Mine wetland).

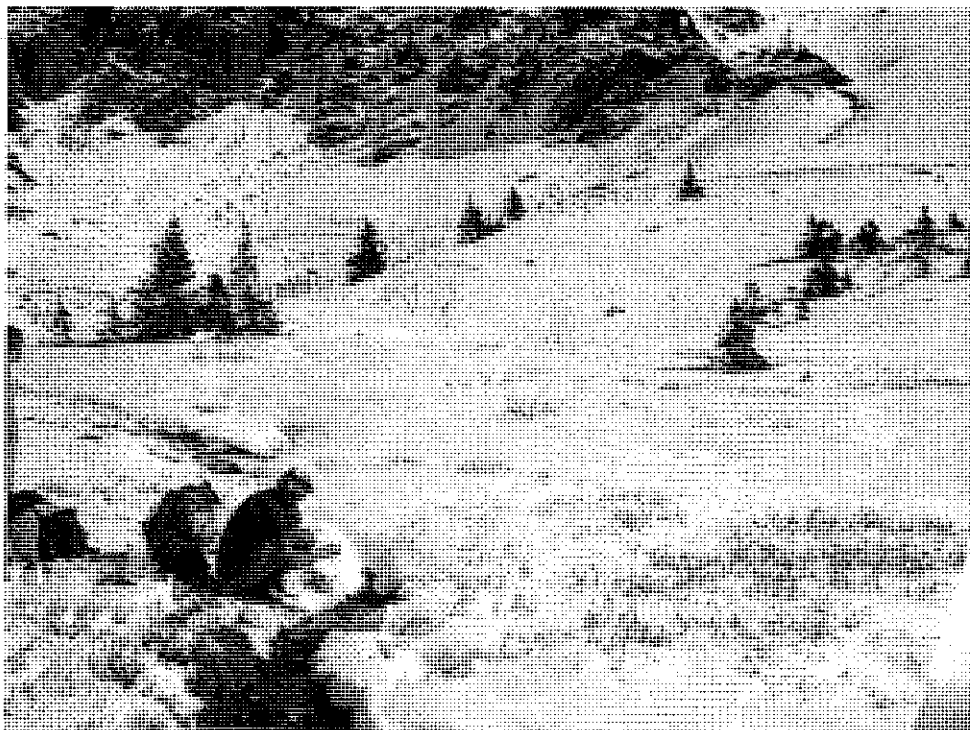


Photo 42

Collection of UASW019 and UASE019 (flow through Mogul Mine wetland).

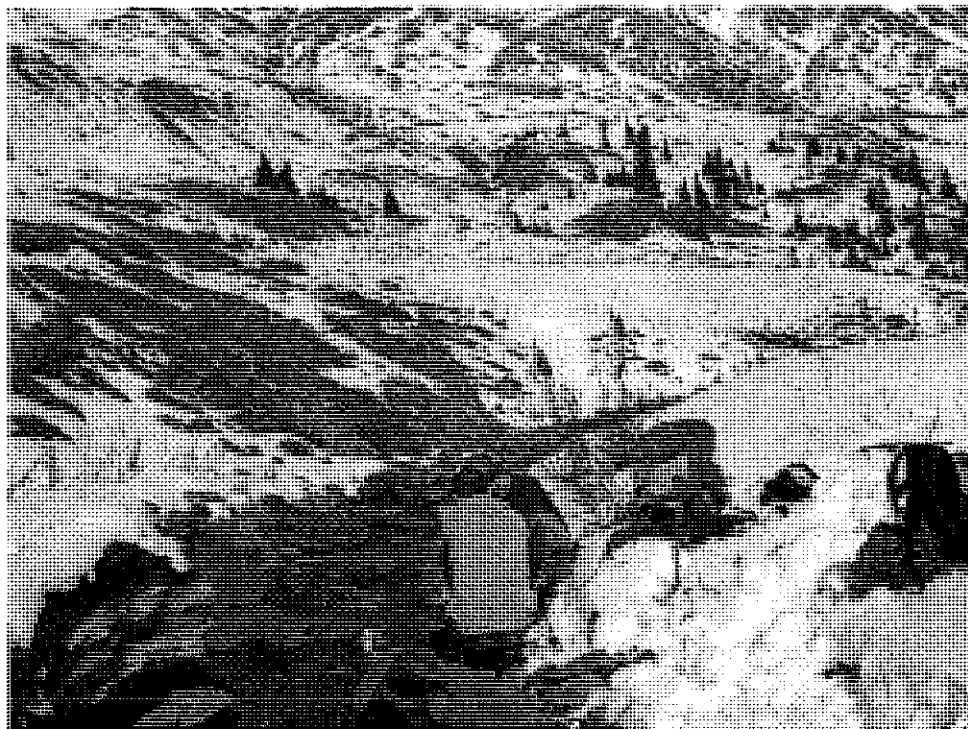


Photo 43
Collection of UASW018 and UASE018 (Cement Creek upstream of Mogul Mine wetland).



Photo 44
Collection of UASW018 and UASE018 (Cement Creek upstream of Mogul Mine wetland).



Photo 45
Collection of UASW020 and UASE020 (Cement Creek upstream of Mogul Mine).



Photo 46
Collection of UAAD004 (Mogul Mine adit discharge).

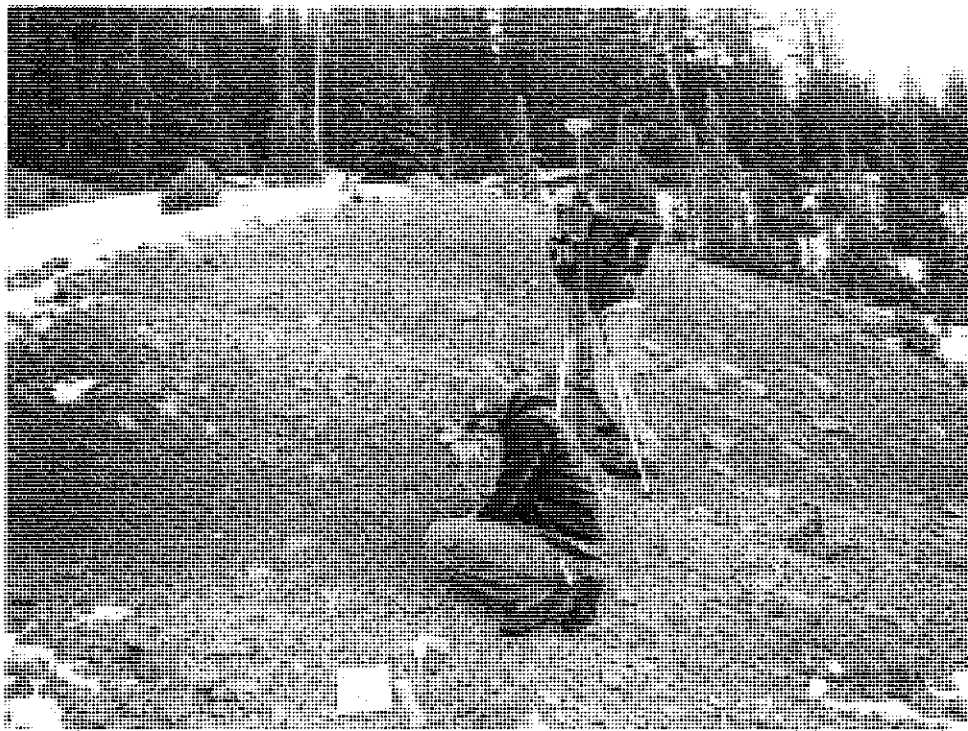


Photo 47
Collection of UASO002 (American Tunnel).



Photo 48
Collection of UASO003 (top pile at Red and Bonita).



Photo 49
Collection of UASO004 (middle pile at Red and Bonita).

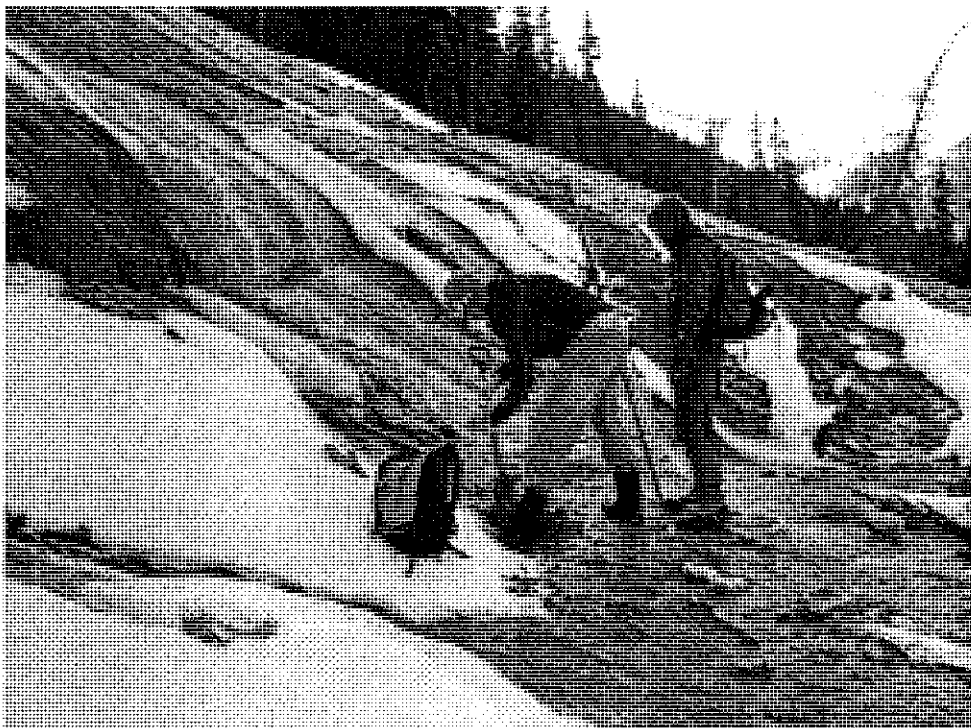


Photo 50
Collection of UASO005 (bottom pile at Red and Bonita).



Photo 51
Red and Bonita waste piles.



Photo 52
Collection of UASW021 and UASE021 (Cement Creek downstream of Mogul North Mine).



Photo 53
Collection of UASW022 and UASE022 (drainage from of Mogul North Mine).



Photo 54
Collection of UASO006 (Mogul North waste pile).

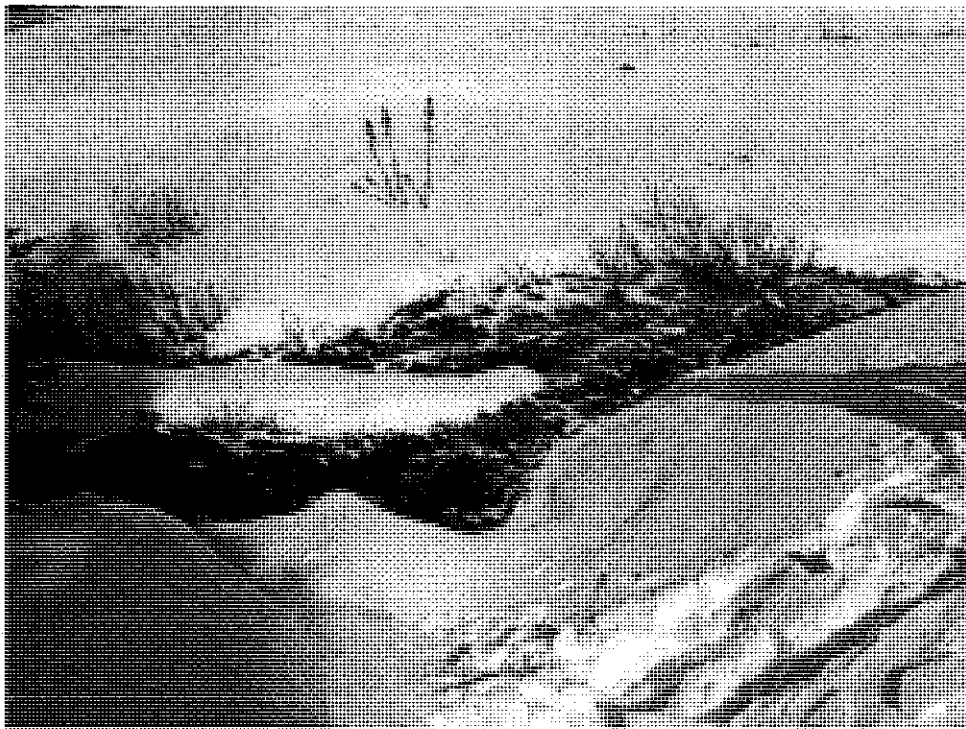


Photo 55
Seepage from the toe of the Mogul North waste pile.

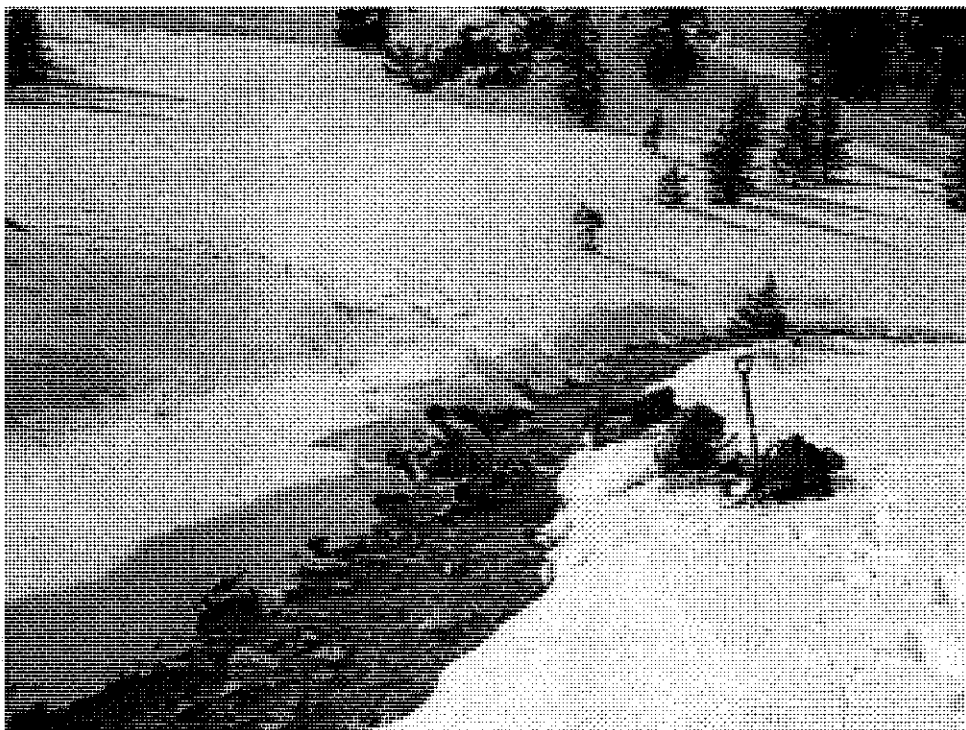


Photo 56
Collection of UASW023 and UASE023 (Cement Creek upstream of Queen Anne Mine).

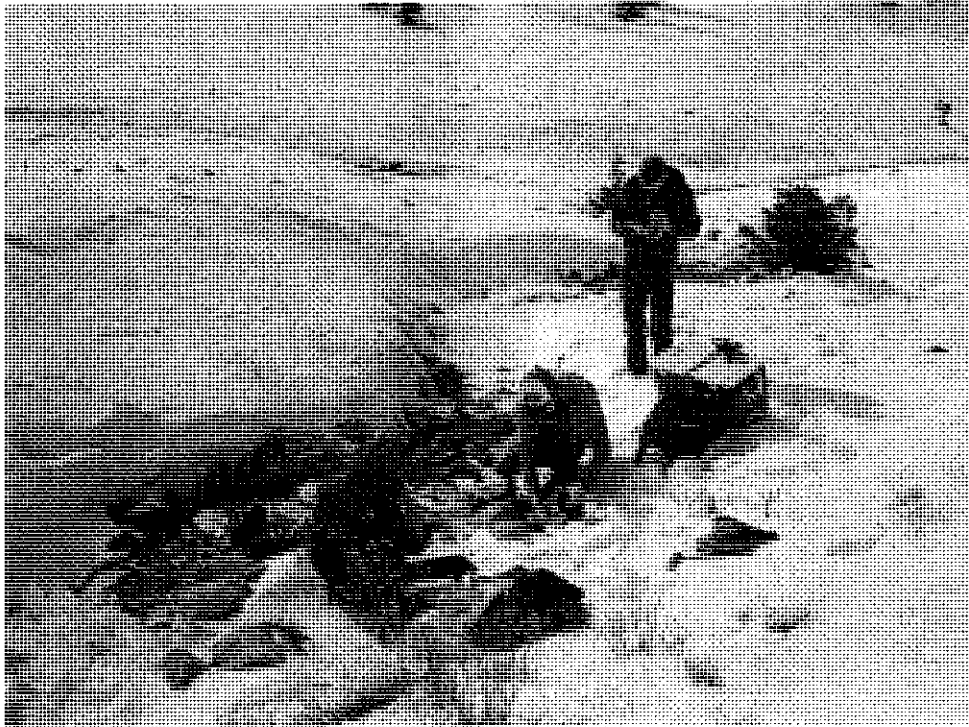


Photo 57
Collection of UASW024 and UASE024 (drainage from Queen Anne Mine).



Photo 58
Collection of UASO007 (Grand Mogul Mine stope – west side).

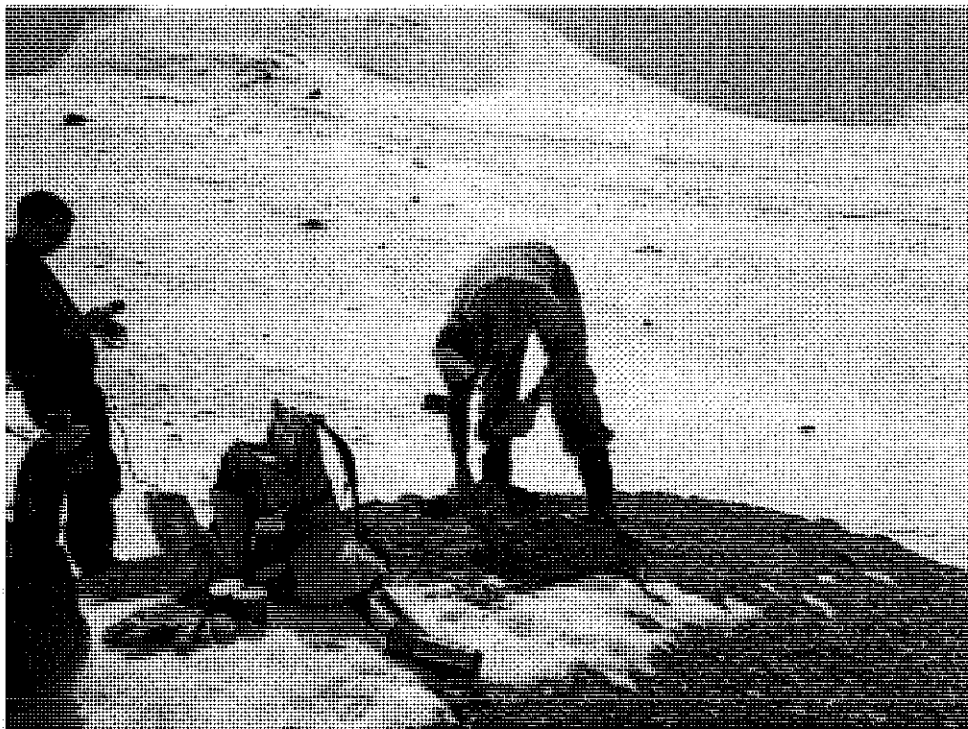


Photo 59
Collection of UASO008 (Grand Mogul Mine stope – east side).



Photo 60
Collection of UASW059 and UASE059 (drainage from Grand Mogul Mine).



Photo 61
Sample team hiking above Grand Mogul Mine.



Photo 62
Collection of UASW030 and UASE030 (Cement Creek upstream of Grand Mogul Mine).

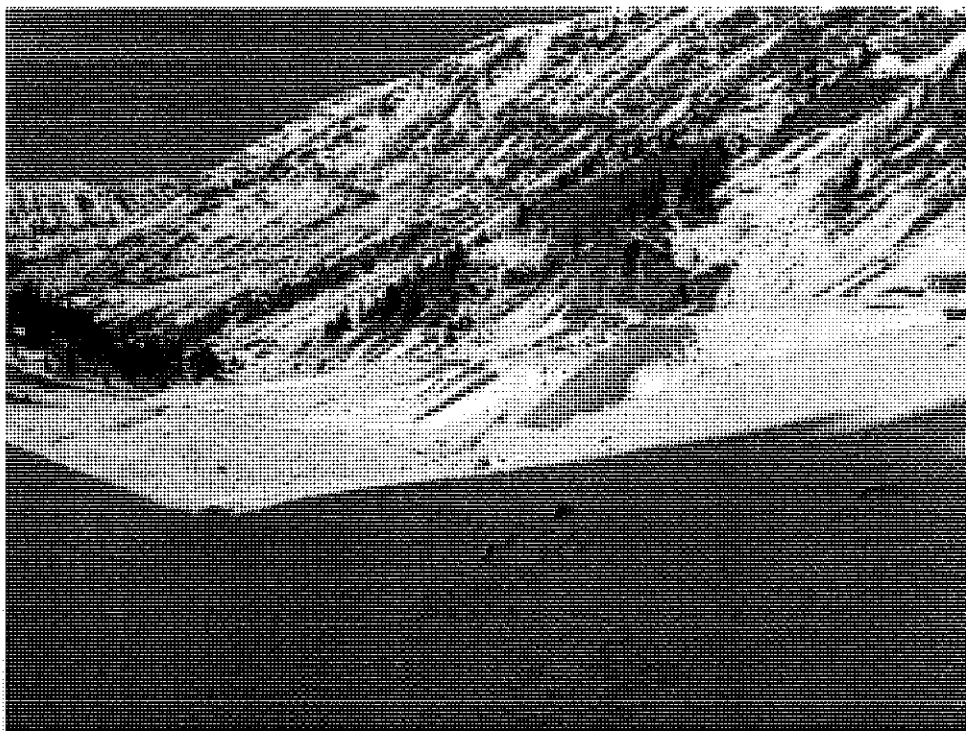


Photo 63
Grand Mogul Mine and Mogul Mine stope waste piles.



Photo 64
Grand Mogul Mine easternmost waste pile.



Photo 65

Collection of UASO009 (Grand Mogul Mine waste piles – east side).



Photo 66

Collection of UASO010 (Grand Mogul Mine waste piles – center).

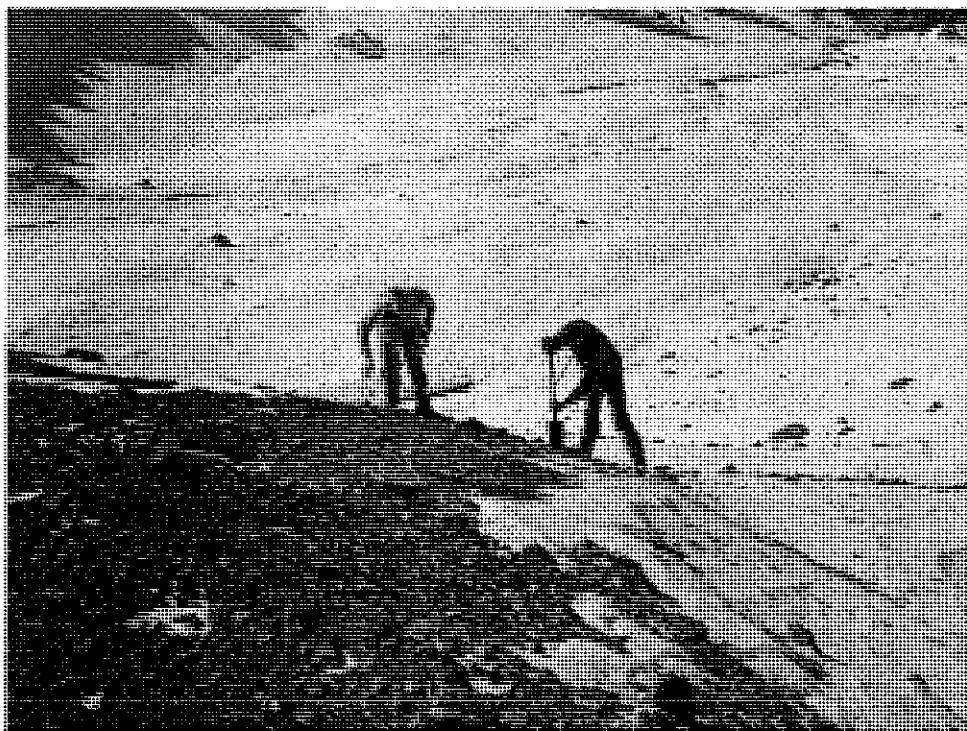


Photo 67
Collection of UASO011 (Grand Mogul Mine waste piles – west side).



Photo 68
Collection of UASO012 (Mogul Mine waste piles – west side).



Photo 69

Collection of UASO013 (Mogul Mine waste piles – adjacent to shed).



Photo 70

Collection of UASO014 (Mogul Mine waste piles – east side).

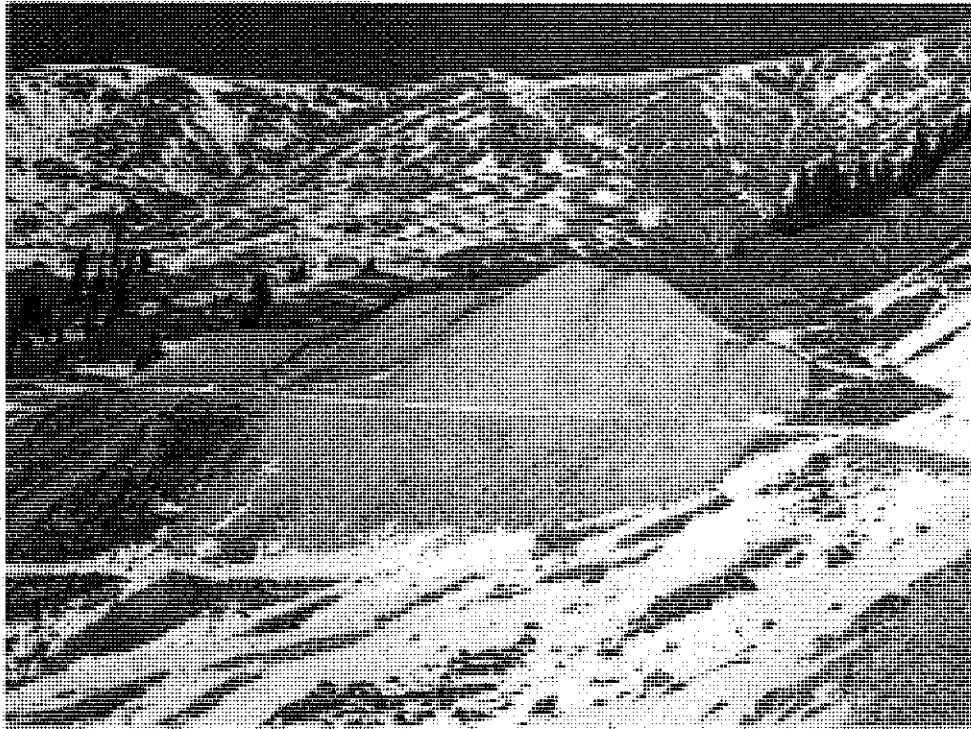


Photo 71
Mogul Mine waste piles.

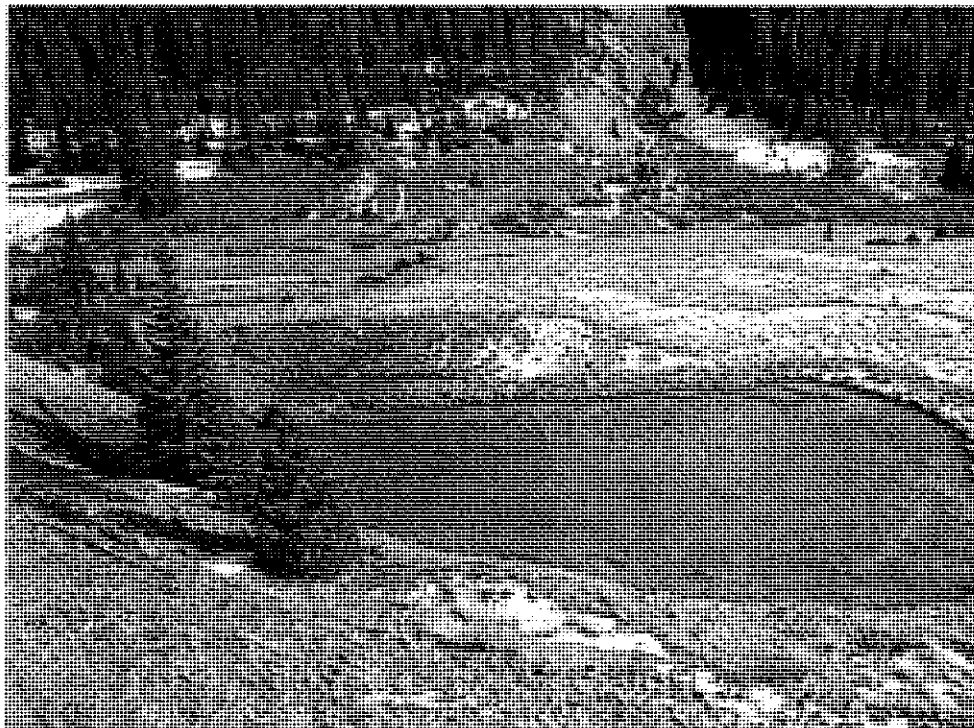


Photo 72
Treatment pond in the vicinity of the Mammoth Tunnel.



Photo 73
Runoff entering treatment pond in the vicinity of the Mammoth Tunnel.

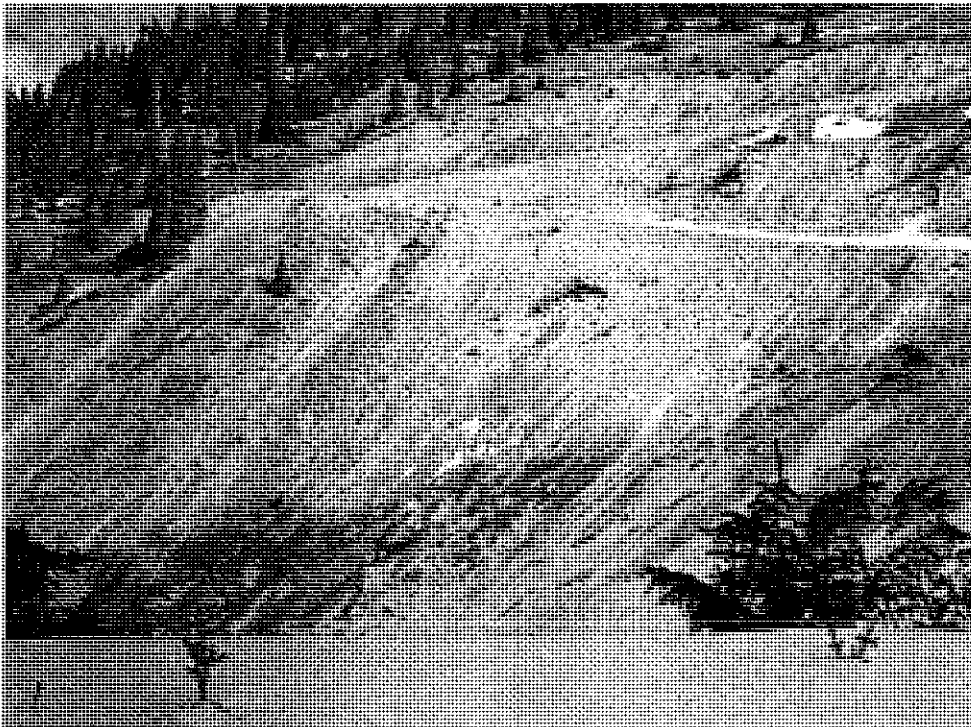


Photo 74
Steep slope of Gold King 7 Level waste piles.

APPENDIX B

Data Validation Packages: Form I Data Sheets and Chain of Custody Forms

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case/TDD No.	Site Name		Operable Unit
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	MH35E5	

Review Assigned Date: December 15, 2010
Review Completion Date: February 18, 2011

Data Validator: Fred Luck
Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
MH35E5	Sediment	CLP -Metals
MH35E6		
MH35E7		
MH35E8		
MH35E9		
MH35F0		
MH35F1		
MH35F2		
MH35F3		
MH35F4		
MH35F5		
MH35F6		
MH35F7		

Sample ID	Matrix	Analysis
MH35F8	Sediment	CLP -Metals
MH35F9		
MH35G0		
MH35G1		
MH35G2		
MH35G3		
MH35G4		

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, Case No. 40755, SDG No. MH35E5, consisted of twenty sediment samples for metals by ICP-AES and ICP-MS (ISM01.2). The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
All Samples	Antimony	U	Blank Contamination	3
MH35E5, MH35E6, MH35F0, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F7, MH35F9, MH35G1, MH35G2, MH35G3, MH35G4	Beryllium			
MH35E5, MH35E6, MH35F0, MH35F3, MH35F4, MH35F6, MH35F7, MH35G0, MH35G1, MH35G2	Cadmium			
MH35F3, MH35F5, MH35G1	Calcium			
MH35F8	Chromium			
MH35F8	Magnesium			
MH35E9, MH35F0, MH35F8, MH35G1, MH35G3	Potassium			
MH35E9, MH35F8	Silver			
All Samples	Sodium			
MH35E5, MH35E6, MH35E7, MH35E8, MH35E9, MH35F0, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F8, MH35F9, MH35G1, MH35G3	Thallium			

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35E7, MH35E8, MH35E9, MH35F8, MH35G0	Beryllium	J+	Potentially false positive detection in ICS check sample	4
MH35E5, MH35E6, MH35E7, MH35E8, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F7, MH35F9, MH35G0, MH35G2, MH35G4	Potassium			
MH35E5, MH35E6, MH35E7, MH35E8, MH35F0, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F7, MH35F9, MH35G0, MH35G1, MH35G2, MH35G3, MH35G4	Silver			
MH35F7, MH35G0, MH35G2, MH35G4	Thallium			
All Samples	Barium, Zinc	J/UJ	Original & Duplicate both >5x the CRQL and RPD > 20%	6
	Cadmium		Original and/or Duplicate < 5x the CRQL and absolute difference > CRQL	
	Antimony, Selenium, Silver		MS 30 - 74%R, Post Digestion Spike %R ≥ 75%	7
	Copper	J	MS <30%R, Post Digestion Spike %R ≥ 75%	
	Arsenic, Beryllium, Cadmium, Cobalt, Copper, Nickel, Potassium, Sodium, Zinc		MS > 125%R, Post Digestion Spike %R ≤ 125%	8
			Serial Dilution %D > 10%	

1. PRESERVATION AND HOLDING TIMES

All technical holding times and preservation criteria were met.

Yes ☐ No ☒

Comments: The samples were analyzed within 180 days for the ICP metals. According to the Sample Log-In Sheet and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. The Sample Log-In Sheet further indicates that neither cooler contained a Cooler Temperature Indicator Bottle, as indicated on the form to be required. There is also no indication that SMO was contacted regarding this issue, neither is any documentation of the resolution or indication of how the cooler temperature was derived provided. The TR/COC also did not designate a sample for laboratory QC, but the documentation of the resolution of this issue is provided in the SDG.

When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

The sampler did not designate a specific sample on the TR/COC for Laboratory QC; in accordance with reported previous Region 8 direction, the laboratory did select a sample (MH35G4) for laboratory QC. The reviewer has not been provided any information regarding PE, field blank, or rinsate samples; therefore cannot evaluate whether the selected sample was a PE, field blank, or rinsate sample.

No other shipping or receiving problems were noted. Chain-of-custody, summary forms, and raw data were evaluated.

2. INSTRUMENT CALIBRATIONS: INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV)

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes ☒ No ☐

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes ☒ No ☐

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes X No

Comments: None.

3. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes X No

Comments: For the ICP-AES analyses, the ICB was rerun.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: Continuing calibration blanks were run every 10 samples.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None.

All analyzed blanks were free of contamination.

Yes No X

Comments: The following table lists the blanks with contamination that resulted in sample qualification, elements present, affected samples, and data qualifiers:

Blank Contaminants

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Antimony	1	0.0097	0.013	MH35E5	1.3	2.1 U
					MH35E6	0.68	1.4 U
					MH35E7	0.22	1.3 U
					MH35E8	0.98	1.6 U
					MH35E9	0.79	1.3 U
					MH35F0	0.44	1.7 U
					MH35F1	1.1	1.6 U
					MH35F2	0.56	1.4 U
					MH35F3	0.87	1.6 U
					MH35F4	0.88	1.4 U
					MH35F5	1.2	1.3 U
					MH35F6	0.38	1.5 U
					MH35F7	0.58	1.9 U
					MH35F8	0.94	2.5 U
					MH35F9	0.41	1.3 U
					MH35G0	0.42	1.4 U
					MH35G1	1.4	3.8 U
					MH35G2	0.44	1.6 U
					MH35G3	0.59	1.3 U
					MH35G4	0.33	1.6 U
PB	Beryllium	0.5	0.0032	0.011	MH35E5	0.44	1.0 U
					MH35E6	0.33	0.72 U
					MH35F0	0.66	0.87 U
					MH35F1	0.39	0.78 U
					MH35F2	0.38	0.68 U
					MH35F3	0.41	0.82 U
					MH35F4	0.38	0.71 U
					MH35F5	0.41	0.64 U
					MH35F6	0.41	0.74 U
					MH35F7	0.57	0.93 U
					MH35F9	0.46	0.66 U
					MH35G1	0.29	1.9 U
					MH35G2	0.47	0.78 U
					MH35G3	0.46	0.64 U
					MH35G4	0.56	0.81 U
PB	Cadmium	0.5	0.0027	0.500	MH35E5	0.74	1.0 U
					MH35E6	0.66	0.72 U
					MH35F0	0.78	0.87 U
					MH35F3	0.52	0.82 U
					MH35F4	0.47	0.71 U
					MH35F6	0.51	0.74 U
					MH35F7	0.79	0.93 U
					MH35G0	0.35	0.68 U
					MH35G1	0.45	1.9 U
PB	Calcium	500	1.7	4.404	MH35F3	791	822 U
					MH35F5	230	644 U
					MH35G1	1150	1900 U
PB	Chromium	1	0.026	1.000	MH35F8	1.6	2.5 U
PB	Magnesium	500	1.2	500	MH35F8	447	1240 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Potassium	500	5.8	55.883	MH35E9	375	674 U
					MH35F0	842	865 U
					MH35F8	209	1240 U
					MH35G1	1160	1900 U
					MH35G3	510	636 U
PB	Silver	0.5	0.0023	0.010	MH35E9	0.48	0.67 U
					MH35F8	0.22	1.2 U
PB	Sodium	500	0.73	18.271	MH35E5	117	1040 U
					MH35E6	60.2	723 U
					MH35E7	49.7	641 U
					MH35E8	92.9	814 U
					MH35E9	180	674 U
					MH35F0	58.1	865 U
					MH35F1	88.1	781 U
					MH35F2	75.6	676 U
					MH35F3	76.1	822 U
					MH35F4	68.7	714 U
					MH35F5	69.8	644 U
					MH35F6	90.6	741 U
					MH35F7	109	926 U
					MH35F8	32.3	1240 U
					MH35F9	62.4	657 U
					MH35G0	56.6	684 U
					MH35G1	77.5	1900 U
					MH35G2	100	782 U
					MH35G3	25.2	636 U
					MH35G4	94.7	813 U
PB	Thallium	0.5	0.0015	0.007	MH35E5	0.72	1.0 U
					MH35E6	0.41	0.72 U
					MH35E7	0.32	0.64 U
					MH35E8	0.45	0.81 U
					MH35E9	0.19	0.67 U
					MH35F0	0.31	0.87 U
					MH35F1	0.62	0.78 U
					MH35F2	0.41	0.68 U
					MH35F3	0.75	0.82 U
					MH35F4	0.69	0.71 U
					MH35F5	0.59	0.64 U
					MH35F6	0.44	0.74 U
					MH35F8	0.26	1.2 U
					MH35F9	0.36	0.66 U
					MH35G1	0.43	1.9 U
					MH35G3	0.42	0.64 U

4. INDUCTIVELY COUPLED PLASMA - INTERFERENCE CHECK SAMPLE (ICP-ICS)

The ICP interference check sample (ICS) was run at the beginning and end of each sample analysis run and every 20 analytical samples, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within \pm the CRQL.

Yes X No

Comments: None.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values or no interference was noted.

Yes X No NA

Comments: None.

Sample results contain potential false positives and false negatives.

Yes X No

Comments: The following table lists the elements with potential false positives or false negatives that resulted in sample qualification, affected samples, and data qualifiers:

ICP Interferences

Element	Concentration Found in ICSA Sample (ug/L)	Affected Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
Beryllium	0.37	MH35E7 MH35E8 MH35E9 MH35F8 MH35G0	>MDL	J+
Potassium	1020	MH35E5 MH35E6 MH35E7 MH35E8 MH35F1 MH35F2 MH35F3 MH35F4 MH35F5 MH35F6 MH35F7 MH35F9 MH35G0 MH35G2 MH35G4		
Silver	0.015	MH35E5 MH35E6 MH35E7 MH35E8 MH35F0 MH35F1 MH35F2 MH35F3 MH35F4 MH35F5 MH35F6 MH35F7 MH35F9 MH35G0 MH35G1 MH35G2 MH35G3 MH35G4		
Thallium	0.056	MH35F7 MH35G0 MH35G2 MH35G4		

5. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No

Comments: None.

All results were within control limits OF 70-130%.

Yes X No

Comments: None.

6. FORM 6 & 12 - DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No NA

Comments: None.

The RPDs were calculated correctly.

Yes X No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were within $\pm 20\%$ (limits of $\pm 35\%$ apply for soil/sediments/tailings samples).

Yes No X NA

Comments: The following table lists the duplicate results outside control limits, samples affected, and data qualifiers:

Element	RPD	QC Limit	Samples Affected	Qualifiers
Barium	57%	20%	All samples	J / UJ
Zinc	75%			

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of CRQL (absolute difference < CRQL for soils).

Yes___ No X NA___

Comments: The following table lists the duplicate results outside control limits, samples affected, and data qualifiers:

Element	Sample / Duplicate Result (mg / Kg)	% RPD	5x CRQL (mg / Kg)	Samples Affected	Qualifiers
Cadmium	2.73 / 1.13	83 %	2.5	All samples	J / UJ

7. SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No___ NA___

Comments: None.

The percent recoveries (%Rs) were calculated correctly.

Yes X No___ NA___

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes___ No X

Comments: The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Antimony	13%	168%	All samples	J/UJ
Cadmium	61%	83%		
Copper	182%	77%		J
Selenium	6%	114%		J/UJ
Silver	1%	87%		

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes X No__ NA__

Comments: None.

8. ICP SERIAL DILUTION

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes X No__

Comments: None.

The serial dilution was without interference problems as defined by the SOW.

Yes__ No X

Comments: The following serial dilution %Ds were greater than 10% and the original sample result was at least 50* the MDL:

Element	% Difference	Samples Affected	Qualifiers
Arsenic	30%	All samples	J
Beryllium	14%		
Cadmium	11%		
Cobalt	13%		
Copper	18%		
Nickel	15%		
Potassium	19%		
Sodium	30%		
Zinc	30%		

9. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

Yes__ No__ NA X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

10. FORM 10 - INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes X No__

Comments: None.

11. FORM 12 - PREPARATION LOG

Information on the preparation of samples for analysis was reported on Form 12.

Yes X No__

Comments: None.

12. FORM 13 - ANALYSIS RUN LOG

A Form 13 with the required information was filled out for each analysis run in the data package.

Yes X No__

Comments: None.

13. Additional Comments or Problems/Resolutions Not Addressed Above

Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

INORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

ACRONYMS

AA	Atomic Absorption
Ag	Silver
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRA	CRQL standard required for AA
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
GFAA	Graphite Furnace Atomic Absorption
Hg	Mercury
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LRA	Linear Range Verification Analysis
MDL	Method Detection Limit
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

000146

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768001
 % Solids: 48.3 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6860			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1100			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	78100			P
7439-92-1	Lead				
7439-95-4	Magnesium	3030			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1700		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	117.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: NA

Comments:

E: The reported value is estimated due to the presence of interference.

000147

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768001
 % Solids: 48.3 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.3	J	N	MS
7440-38-2	Arsenic	45.3		E	MS
7440-39-3	Barium	559.		*	MS
7440-41-7	Beryllium	0.44	J	E	MS
7440-43-9	Cadmium	0.74	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.6		*	MS
7440-48-4	Cobalt	3.9		E	MS
7440-50-8	Copper	48.7		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	459.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	333.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.4		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.6	J	N	MS
7440-22-4	Silver	4.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.72	J		MS
7440-62-2	Vanadium	49.7		*	MS
7440-66-6	Zinc	205.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUM
 Color After: WHITE Clarity After: CLOUDY Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000148

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768002
 % Solids: 69.2 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7030			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1010			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	68800			P
7439-92-1	Lead				
7439-95-4	Magnesium	4080			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	889.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	60.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J + M
723 JH
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000149

EPA SAMPLE NO.

MH35E6

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768002
% Solids: 69.2 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.68	J	N	MS
7440-38-2	Arsenic	34.1		E	MS
7440-39-3	Barium	210.		*	MS
7440-41-7	Beryllium	0.33	J	E	MS
7440-43-9	Cadmium	0.66	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.4		*	MS
7440-48-4	Cobalt	4.3		E	MS
7440-50-8	Copper	53.0		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	322.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	506.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.0		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.81	J	N	MS
7440-22-4	Silver	2.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.41	J		MS
7440-62-2	Vanadium	44.8		*	MS
7440-66-6	Zinc	199.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E7

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768003
% Solids: 78.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8570			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2560			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	20800			P
7439-92-1	Lead				
7439-95-4	Magnesium	5610			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	745.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	49.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: ... Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000150

J+ M
641 UZ
2/18/11

000151

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768003
 % Solids: 78.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.22	J	N	MS
7440-38-2	Arsenic	5.9		E	MS
7440-39-3	Barium	108.		*	MS
7440-41-7	Beryllium	1.0		E	MS
7440-43-9	Cadmium	5.8		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.5		*	MS
7440-48-4	Cobalt	10.9		E	MS
7440-50-8	Copper	119.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	612.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	6750		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	8.2		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.099	J	N	MS
7440-22-4	Silver	1.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.32	J		MS
7440-62-2	Vanadium	30.6		*	MS
7440-66-6	Zinc	1470		D*E	MS
57-12-5	Cyanide				

Color Before: BLACK Clarity Before: Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000152

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATAC Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768004
 % Solids: 61.4 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12300			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2010			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	58100			P
7439-92-1	Lead				
7439-95-4	Magnesium	4270			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1260		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	92.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000153

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768004
 % Solids: 61.4 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.98	J	N	MS
7440-38-2	Arsenic	27.3		E	MS
7440-39-3	Barium	261.		*	MS
7440-41-7	Beryllium	0.89		E	MS
7440-43-9	Cadmium	2.0		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.6		*	MS
7440-48-4	Cobalt	12.3		E	MS
7440-50-8	Copper	167.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	734.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	2710		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	5.2		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.52	J	N	MS
7440-22-4	Silver	2.8		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.45	J		MS
7440-62-2	Vanadium	41.1		*	MS
7440-66-6	Zinc	447.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUMColor After: TAN Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000154

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768005
 % Solids: 74.2 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8000			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2050			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	26000			P
7439-92-1	Lead				
7439-95-4	Magnesium	3730			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	375.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	180.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000155

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768005
 % Solids: 74.2 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.79	J	N	MS
7440-38-2	Arsenic	14.2		DE	MS
7440-39-3	Barium	79.3		*	MS
7440-41-7	Beryllium	0.75		E	MS
7440-43-9	Cadmium	0.97		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.9		D*	MS
7440-48-4	Cobalt	11.0		DE	MS
7440-50-8	Copper	201.		DNE	MS
7439-89-6	Iron				
7439-92-1	Lead	187.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1160		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	5.9		DE	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.45	J	DN	MS
7440-22-4	Silver	0.48	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.19	J		MS
7440-62-2	Vanadium	36.1		D*	MS
7440-66-6	Zinc	289.		D*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000156

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768006
 % Solids: 57.8 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11600			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1810			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	44300			P
7439-92-1	Lead				
7439-95-4	Magnesium	6090			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	842.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	58.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

8650 TH8650 TH
9/18/11

000157

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768006
 % Solids: 57.8 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.44	J	N	MS
7440-38-2	Arsenic	13.3		E	MS
7440-39-3	Barium	123.		*	MS
7440-41-7	Beryllium	0.66	J	E	MS
7440-43-9	Cadmium	0.78	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.7		*	MS
7440-48-4	Cobalt	5.4		E	MS
7440-50-8	Copper	91.4		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	366.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1440		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.51	J	N	MS
7440-22-4	Silver	1.2		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J		MS
7440-62-2	Vanadium	25.8		*	MS
7440-66-6	Zinc	241.		*E	MS
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: BROWN Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000158

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768007
 % Solids: 64.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5900			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	934.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	71700		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2440			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1300		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	88.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ ^{Fe}/₂
781 ^u/₃₂
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000159

EPA SAMPLE NO.

MH35F1

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768007
% Solids: 64.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.1	J	N	MS
7440-38-2	Arsenic	41.7		E	MS
7440-39-3	Barium	424.		*	MS
7440-41-7	Beryllium	0.39	J	E	MS
7440-43-9	Cadmium	0.83		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.2		*	MS
7440-48-4	Cobalt	3.8		E	MS
7440-50-8	Copper	42.7		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	394.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	421.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.1		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.5	J	N	MS
7440-22-4	Silver	2.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.62	J		MS
7440-62-2	Vanadium	40.7		*	MS
7440-66-6	Zinc	197.		*E	MS
57-12-5	Cyanide				

1.6 USth
Jth
Jth
0.780th
Jth
Jth Kth 2/9/11
Jth Kth
Jth Kth
Jth Kth 2/9/11
Jth Kth
Jth Kth
3.90th Jth Kth
Jth Kth
0.780th
Jth Kth 2/9/11
Jth Kth 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000160

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATAC Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768008
 % Solids: 74.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7040			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1040			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	62200		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	3760			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1090		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	75.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M

676 U M
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000161

EPA SAMPLE NO.

MH35F2

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768008
% Solids: 74.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.56	J	N	MS
7440-38-2	Arsenic	35.3		E	MS
7440-39-3	Barium	342.		*	MS
7440-41-7	Beryllium	0.38	J	E	MS
7440-43-9	Cadmium	1.4		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.7		*	MS
7440-48-4	Cobalt	4.8		E	MS
7440-50-8	Copper	98.6		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	306.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	580.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.4		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.0	J	N	MS
7440-22-4	Silver	1.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.41	J		MS
7440-62-2	Vanadium	42.3		*	MS
7440-66-6	Zinc	360.		*E	MS
57-12-5	Cyanide				

1.405 ⁷⁴
J ⁷⁴
J ⁷⁴
0.680 ⁷⁴
J ⁷⁴
J ⁷⁴ 1/3A
J ⁷⁴ 3/11/11
J ⁷⁴
J ⁷⁴ 1/3A
J ⁷⁴ 2/9/11
J ⁷⁴
3.40 ⁷⁴ J ⁷⁴
J ⁷⁴ + ⁷⁴
0.680 ⁷⁴
J ⁷⁴ 1/3A
J ⁷⁴ 2/9/11
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000162

EPA SAMPLE NO.

MH35F3

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768009
% Solids: 60.8 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4890			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	791.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	88900		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2180			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1200		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	76.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

8220 ^u ^u

J+ ^u

8220 ^u ^u
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000163

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768009
 % Solids: 60.8 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.87	J	N	MS
7440-38-2	Arsenic	57.0		E	MS
7440-39-3	Barium	317.		*	MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	0.52	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.8		*	MS
7440-48-4	Cobalt	3.6		E	MS
7440-50-8	Copper	41.8		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	541.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	436.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.2		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.4	J	N	MS
7440-22-4	Silver	2.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.75	J		MS
7440-62-2	Vanadium	48.6		*	MS
7440-66-6	Zinc	153.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUM
 Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000164

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768010
 % Solids: 70.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5540			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	735.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	56500			P
7439-92-1	Lead				
7439-95-4	Magnesium	2810			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1270		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	68.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ K
714 U K
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000165

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768010
 % Solids: 70.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.88	J	N	MS
7440-38-2	Arsenic	34.0		E	MS
7440-39-3	Barium	422.		*	MS
7440-41-7	Beryllium	0.38	J	E	MS
7440-43-9	Cadmium	0.47	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.9		*	MS
7440-48-4	Cobalt	3.1		E	MS
7440-50-8	Copper	29.8		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	361.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	311.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.8		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.3	J	N	MS
7440-22-4	Silver	1.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.69	J		MS
7440-62-2	Vanadium	34.6		*	MS
7440-66-6	Zinc	136.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000166

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768011
 % Solids: 77.7 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5240			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	230.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	44400			P
7439-92-1	Lead				
7439-95-4	Magnesium	2570			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1230		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	69.8	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

644 U ⁷²J+ ⁷²644 U ⁷²

2/18/11

Color Before: BROWN Clarify Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000167

EPA SAMPLE NO.

MH35F5

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768011
% Solids: 77.7 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.2	J	N	MS
7440-38-2	Arsenic	54.8		E	MS
7440-39-3	Barium	582.		*	MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	2.6		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.5		*	MS
7440-48-4	Cobalt	4.0		E	MS
7440-50-8	Copper	40.4		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	598.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	304.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.0	J	N	MS
7440-22-4	Silver	3.6		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.59	J		MS
7440-62-2	Vanadium	36.4		*	MS
7440-66-6	Zinc	604.		*E	MS
57-12-5	Cyanide				

1.3 UJ
J #
J #
0.64 U
J #
J # KA
J # 3/11/11
J #
J # KA
J # 2/18/11
J #
3.2 UJ
J+ #
0.64 U
J # KA
J # 3/19/11
N/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: WHITE Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000168

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768012
 % Solids: 67.5 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8220			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1040			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	94600		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	4550			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1060		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	80.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000169

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768012
 % Solids: 67.5 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.38	J	N	MS
7440-38-2	Arsenic	34.3		E	MS
7440-39-3	Barium	121.		*	MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	0.51	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.6		*	MS
7440-48-4	Cobalt	5.5		E	MS
7440-50-8	Copper	55.2		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	334.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	831.		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.81	J	N	MS
7440-22-4	Silver	1.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.44	J		MS
7440-62-2	Vanadium	49.9		*	MS
7440-66-6	Zinc	186.		*E	MS
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000170

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768013
 % Solids: 54.0 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5710			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1040			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	123000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2360			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1410		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	109.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000171

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F7

Lab Name: ALS Laboratory GroupContract: EPW09036Lab Code: DATA C Case No.: 40755Mod. Ref. No.: _____ SDG No.: MH35E5Matrix: SoilLab Sample ID: 1030768013% Solids: 54.0Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.58	J	N	MS
7440-38-2	Arsenic	37.2		E	MS
7440-39-3	Barium	258.		*	MS
7440-41-7	Beryllium	0.57	J	E	MS
7440-43-9	Cadmium	0.79	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	8.4		*	MS
7440-48-4	Cobalt	4.4		E	MS
7440-50-8	Copper	59.7		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	417.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	636.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.6		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.1	J	N	MS
7440-22-4	Silver	2.2		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.99			MS
7440-62-2	Vanadium	71.7		*	MS
7440-66-6	Zinc	225.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE

Clarity Before: _____

Texture: MEDIUMColor After: BROWNClarity After: CLEAR

Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000172

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768014
 % Solids: 40.4 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5060			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	4130			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	860000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	447.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	209.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	32.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1240 U⁷²1240 U⁷³1240 U⁷²
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000173

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F8

Lab Name: ALS Laboratory GroupContract: EPW09036Lab Code: DATACase No.: 40755

Mod. Ref. No.: _____

SDG No.: MH35E5Matrix: SoilLab Sample ID: 1030768014% Solids: 40.4Date Received: 11/03/2010Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.94	J	N	MS
7440-38-2	Arsenic	103.		E	MS
7440-39-3	Barium	36.3		*	MS
7440-41-7	Beryllium	10.3		E	MS
7440-43-9	Cadmium	4.1		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	1.6	J	*	MS
7440-48-4	Cobalt	17.0		E	MS
7440-50-8	Copper	110.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	255.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	2410		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.21	J	N	MS
7440-22-4	Silver	0.22	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.26	J		MS
7440-62-2	Vanadium	13.4		*	MS
7440-66-6	Zinc	2470		D*E	MS
57-12-5	Cyanide				

2.5 UJH
J
J
J
J
J

2.5 UJH
J
J

J 2/18/11
J 2/18/11

6.2 UJH
1.2 UJH

1.2 UJH
J 2/18/11
J 2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000174

EPA SAMPLE NO.

MH35F9

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768015
% Solids: 76.1 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8860			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2020			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	67200		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	5080			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	933.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	62.4	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J + #
6570 #
2/18/11

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

000175

MH35F9

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

1.3 U^{PA}
J 7
J 8
0.66 U V
I H
~~J 7 KA~~ 3/9/11
~~J 7~~
~~J H.~~

~~J 7 KA~~ 3/9/11
J H
3.3 U^H J^H
J+ H
0.66 U^H
~~J 7 KA~~ 3/2/11
~~J H~~ 2/18/11

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000176

EPA SAMPLE NO.

MH35G0

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768016
% Solids: 73.1 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10400			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1350			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	37000			P
7439-92-1	Lead				
7439-95-4	Magnesium	3850			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1310		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	56.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ *JK*
6840 *JK*
2/18/11

Color Before: BROWN Clarity Before: S Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000177

MH35G0

Date Received: 11/03/2010

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.42	J	N	MS
7440-38-2	Arsenic	46.9		DE	MS
7440-39-3	Barium	314.		*	MS
7440-41-7	Beryllium	0.96	J	DE	MS
7440-43-9	Cadmium	0.35	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.8		D*	MS
7440-48-4	Cobalt	14.8		DE	MS
7440-50-8	Copper	77.1		DNE	MS
7439-89-6	Iron				
7439-92-1	Lead	342.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1560		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	7.5		DE	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.1	J	DN	MS
7440-22-4	Silver	1.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.75			MS
7440-62-2	Vanadium	48.6		D*	MS
7440-66-6	Zinc	144.		D*E	MS
57-12-5	Cyanide				

E: The reported value is estimated due to the presence of interference.

000178

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768017
 % Solids: 26.3 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5070			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1150	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	341000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2130			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1160	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	77.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1900 U *JK*1900 U *JK*1900 U *JK*
2/18/11Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000179

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768017
 % Solids: 26.3 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.4	J	N	MS
7440-38-2	Arsenic	115.		E	MS
7440-39-3	Barium	80.6		*	MS
7440-41-7	Beryllium	0.29	J	E	MS
7440-43-9	Cadmium	0.45	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.2		*	MS
7440-48-4	Cobalt	2.1		E	MS
7440-50-8	Copper	112.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	1700			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	540.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.63	J	N	MS
7440-22-4	Silver	4.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.43	J		MS
7440-62-2	Vanadium	96.9		*	MS
7440-66-6	Zinc	177.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: Texture: MEDIUM
 Color After: BROWN Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000180

EPA SAMPLE NO.

MH35G2

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768018
% Solids: 63.9 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6160			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	867.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	57100			P
7439-92-1	Lead				
7439-95-4	Magnesium	2360			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1350		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	100.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

J+ 77

782 U 77
2/18/11

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000181

EPA SAMPLE NO.

MH35G2

Lab Name: ALS Laboratory Group

Contract: EPW09036

Lab Code: DATA Case No.: 40755

Mod. Ref. No.: _____ SDG No.: MH35E5

Matrix: Soil

Lab Sample ID: 1030768018

% Solids: 63.9

Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.44	J	N	MS
7440-38-2	Arsenic	24.3		E	MS
7440-39-3	Barium	226.		*	MS
7440-41-7	Beryllium	0.47	J	E	MS
7440-43-9	Cadmium	0.44	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.9		*	MS
7440-48-4	Cobalt	2.9		E	MS
7440-50-8	Copper	47.8		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	304.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	407.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.8		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.0	J	N	MS
7440-22-4	Silver	1.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.80			MS
7440-62-2	Vanadium	56.3		*	MS
7440-66-6	Zinc	131.		*E	MS
57-12-5	Cyanide				

1.6 UJ ~~24~~
J ~~24~~
J ~~24~~
0.780 ~~24~~
0.780 ~~24~~
I ~~24~~ KA
J ~~24~~ 3/12/11
J ~~24~~

I ~~24~~ KA
J ~~24~~ 3/12/11

J ~~24~~
3.94 ~~24~~ J ~~24~~
J+ ~~24~~
J+ ~~24~~ KA
J ~~24~~ 3/12/11
J ~~24~~ 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000182

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768019
 % Solids: 78.6 Date Received: 11/03/2010

Concentration Units (ug/L; ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7840			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1120			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	33000			P
7439-92-1	Lead				
7439-95-4	Magnesium	6800			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	510.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	25.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

636 U. 72

636 U. 72

2/18/11

Color Before: BROWN Clarity Before: Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

MH35G3

Lab Name: <u>ALS Laboratory Group</u>	Contract: <u>EPW09036</u>
Lab Code: <u>DATA C</u> Case No.: <u>40755</u>	Mod. Ref. No.: _____ SDG No.: <u>MH35E5</u>
Matrix: <u>Soil</u>	Lab Sample ID: <u>1030768019</u>
% Solids: <u>78.6</u>	Date Received: <u>11/03/2010</u>

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.59	J	N	MS
7440-38-2	Arsenic	37.7		E	MS
7440-39-3	Barium	95.5		*	MS
7440-41-7	Beryllium	0.46	J	E	MS
7440-43-9	Cadmium	17.5		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.9		*	MS
7440-48-4	Cobalt	9.3		E	MS
7440-50-8	Copper	159.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	847.		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1200		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	7.1		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.92	J	N	MS
7440-22-4	Silver	2.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.42	J		MS
7440-62-2	Vanadium	65.9		*	MS
7440-66-6	Zinc	4910		D*E	MS
57-12-5	Cyanide				

E: The reported value is estimated due to the presence of interference.

000184

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768020
 % Solids: 61.5 Date Received: 11/03/2010

Concentration Units (ug/L, ug or mg/kg dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6640			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1050			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	81600		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	3090			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1230		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	94.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

MH35G4

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768020
% Solids: 61.5 Date Received: 11/03/2010

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.33	J	N	MS
7440-38-2	Arsenic	34.7		E	MS
7440-39-3	Barium	250.		*	MS
7440-41-7	Beryllium	0.56	J	E	MS
7440-43-9	Cadmium	2.7		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	9.9		*	MS
7440-48-4	Cobalt	6.4		E	MS
7440-50-8	Copper	60.0		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	346.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1380		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.7		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.0	J	N	MS
7440-22-4	Silver	1.7		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.90			MS
7440-62-2	Vanadium	72.2		*	MS
7440-66-6	Zinc	693.		*E	MS
57-12-5	Cyanide				

E: The reported value is estimated due to the presence of interference.

UOS

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Data Validation Report

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case/TDD No.	Site Name		Operable Unit
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	MH35G5	

Review Assigned Date: December 15, 2010

Data Validator: Fred Luck

Review Completion Date: February 18, 2011

Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
MH35G5	Sediment	CLP -Metals
MH35G6		
MH35G7		
MH35G8		
MH35G9		
MH35H0		
MH35H1		
MH35H2		
MH35H3		
MH35H4		
MH35H5		
MH35H6		
MH35H8	Mine Sediment	
MH35H9		

UOS

URS Operating Services, Inc.

000187

Data Validation Report

Sample ID	Matrix	Analysis
MH35J0	Sediment	CLP -Metals
MH35J1		
MH35J2	Mine Sediment	
MH35J3	Sediment	
MH35J4	Soil - Surface	
MH35J5		

UOS

URS Operating Services, Inc.

Data Validation Report

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
() Data are UNACCEPTABLE according to EPA Functional Guidelines.
(X) Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, Case No. 40755, SDG No. MH35G5, consisted of twenty sediment / mine sediment / soil -surface samples for metals by ICP-AES and ICP-MS (ISM01.2). The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35G5, MH35G6, MH35G7, MH35G8, MH35G9, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Antimony	U	Blank Contamination.	3
MH35G5, MH35G6, MH35G7, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H8, MH35H9, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Beryllium			
MH35G6, MH35G7, MH35G8, MH35G9, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H8, MH35H9, MH35J1, MH35J2, MH35J3, MH35J5	Cadmium			
MH35G5, MH35G7, MH35G9, MH35H2, MH35H4, MH35H5, MH35H6, MH35J1, MH35J2	Calcium			
MH35H9	Chromium			
MH35G7, MH35G9, MH35H0, MH35H8, MH35H9	Cobalt			
MH35G7, MH35G9, MH35H0, MH35H2, MH35H4, MH35H8, MH35H9, MH35J1, MH35J2	Magnesium			
MH35G7, MH35H0, MH35H8, MH35H9	Nickel			

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35G5, MH35G7, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3	Potassium	U	Blank Contamination	3
MH35G5, MH35G6, MH35G7, MH35G8, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Selenium			
MH35G7, MH35G8, MH35H1, MH35H8, MH35H9, MH35J2, MH35J3	Silver			
MH35G5, MH35G6, MH35G7, MH35G8, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Sodium			
MH35G5, MH35G7, MH35G8, MH35G9, MH35H0, MH35H2, MH35H3, MH35H4, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Thallium			
MH35G8, MH35J0	Beryllium	J+	Potentially false positive detection in ICS check sample	4
MH35G6, MH35G8, MH35H5, MH35J4, MH35J5	Potassium			
All Samples	Thallium	UJ	Potentially false negative detection in ICS check sample	7
	Selenium, Zinc	J-/ UJ	MS 30 - 74%R, Post Digestion Spike %R < 75%	
	Antimony, Silver	J /UJ	MS <30%R, Post Digestion Spike %R ≥ 75%	
	Arsenic, Beryllium, Cadmium, Chromium, Copper, Manganese, Nickel, Zinc	J	Serial Dilution %D > 10%	8

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Data Validation Report

1. PRESERVATION AND HOLDING TIMES

All technical holding times and preservation criteria were met.

Yes ☐ No ☒

Comments: The samples were analyzed within 180 days for the ICP metals. According to the Sample Log-In Sheet and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. The Sample Log-In Sheet further indicates that neither cooler contained a Cooler Temperature Indicator Bottle, as indicated on the form to be required. There is also no indication that SMO was contacted regarding this issue, neither is any documentation of the resolution or indication of how the cooler temperature was derived provided.

When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

No other shipping or receiving problems were noted. Chain-of-custody, summary forms, and raw data were evaluated.

2. INSTRUMENT CALIBRATIONS: INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV)

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes ☒ No ☐

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes ☒ No ☐

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes ☒ No ☐

Comments: None.

3. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes X No

Comments: For the ICP-AES analyses, the ICB was rerun.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: Continuing calibration blanks were run every 10 samples.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None.

All analyzed blanks were free of contamination.

Yes No X

Comments: The following table lists the blanks with contamination that resulted in sample qualification, elements present, affected samples, and data qualifiers:

Blank Contaminants

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Antimony	1	0.0097	0.017	MH35G5	0.44	1.3 U
					MH35G6	0.82	1.6 U
					MH35G7	1.1	2.8 U
					MH35G8	0.14	1.3 U
					MH35G9	1.8	3.0 U
					MH35H1	0.46	3.2 U
					MH35H2	0.65	2.7 U
					MH35H3	0.20	1.3 U
					MH35H4	0.74	2.8 U
					MH35H5	0.47	2.2 U
					MH35H6	1.6	2.7 U
					MH35H9	1.2	2.9 U
					MH35J0	0.29	1.7 U
					MH35J1	1.0	3.0 U
					MH35J2	1.7	3.1 U
					MH35J3	0.51	3.5 U
					MH35J4	0.94	1.3 U
					MH35J5	0.14	1.2 U
PB	Beryllium	0.5	0.0032	0.013	MH35G5	0.25	0.63 U
					MH35G6	0.38	0.79 U
					MH35G7	0.13	1.4 U
					MH35G9	0.74	1.5 U
					MH35H0	0.37	1.1 U
					MH35H1	1.1	1.6 U
					MH35H2	0.33	1.4 U
					MH35H3	0.23	0.64 U
					MH35H4	0.41	1.4 U
					MH35H5	0.44	1.1 U
					MH35H6	0.52	1.4 U
					MH35H8	0.26	1.7 U
					MH35H9	1.2	1.5 U
					MH35J1	0.26	1.5 U
					MH35J2	0.13	1.5 U
					MH35J3	1.6	1.7 U
					MH35J4	0.48	0.64 U
					MH35J5	0.44	0.60 U
PB	Cadmium	0.5	0.0027	0.004	MH35G6	0.73	0.79 U
					MH35G7	0.11	1.4 U
					MH35G8	0.42	0.64 U
					MH35G9	1.2	1.5 U
					MH35H1	1.1	1.6 U
					MH35H2	0.58	1.4 U
					MH35H3	0.51	0.64 U
					MH35H4	0.50	1.4 U
					MH35H5	0.70	1.1 U
					MH35H8	0.12	1.7 U
					MH35H9	0.74	1.5 U
					MH35J1	0.28	1.5 U
					MH35J2	1.2	1.5 U
					MH35J3	1.1	1.7 U
					MH35J5	0.11	0.60 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Calcium	500	1.7	1.957	MH35G5	195	627 U
					MH35G7	1110	1380 U
					MH35G9	1390	1500 U
					MH35H2	1330	1370 U
					MH35H4	1110	1410 U
					MH35H5	859	1100 U
					MH35H6	1270	1370 U
					MH35J1	1070	1510 U
					MH35J2	729	1530 U
PB	Chromium	1	0.026	0.060	MH35H9	0.62	2.9 U
PB	Cobalt	1	0.0053	0.500	MH35G7	1.4	2.8 U
					MH35G9	2.3	3.0 U
					MH35H0	1.1	2.2 U
					MH35H8	1.1	3.4 U
					MH35H9	0.62	2.9 U
PB	Magnesium	500	1.2	2.721	MH35G7	753	1380 U
					MH35G9	646	1500 U
					MH35H0	791	1120 U
					MH35H2	1150	1370 U
					MH35H4	941	1410 U
					MH35H8	1460	1680 U
					MH35H9	327	1460 U
					MH35J1	1020	1510 U
					MH35J2	1040	1530 U
PB	Nickel	0.5	0.013	0.500	MH35G7	0.99	1.4 U
					MH35H0	1.1	1.1 U
					MH35H8	1.1	1.7 U
					MH35H9	0.59	1.5 U
PB	Potassium	500	5.8	-8.872	MH35G5	606	627 U
					MH35G7	498	1380 U
					MH35G9	514	1500 U
					MH35H0	504	1120 U
					MH35H1	817	1580 U
					MH35H2	729	1370 U
					MH35H3	297	638 U
					MH35H4	730	1410 U
					MH35H6	956	1370 U
					MH35H8	583	1680 U
					MH35H9	268	1460 U
					MH35J0	703	825 U
					MH35J1	1020	1510 U
					MH35J2	373	1530 U
					MH35J3	974	1740 U
PB	Selenium	2.5	0.036	2.500	MH35G5	1.5	3.1 U
					MH35G6	1.8	4.0 U
					MH35G7	0.78	6.9 U
					MH35G8	1.0	3.2 U
					MH35G9	1.0	7.5 U
					MH35H0	0.83	5.6 U
					MH35H1	1.3	7.9 U
					MH35H2	0.83	6.9 U
					MH35H3	0.92	3.2 U
					MH35H4	0.69	7.1 U
					MH35H5	1.6	5.5 U
					MH35H6	1.1	6.9 U

Blank ID	Contaminant	CROL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Selenium	2.5	0.036	2.500	MH35H8	2.4	8.4 U
					MH35H9	0.34	7.3 U
					MH35J0	0.32	4.1 U
					MH35J1	1.5	7.6 U
					MH35J2	0.23	7.6 U
					MH35J3	1.2	8.7 U
					MH35J4	0.85	3.2 U
					MH35J5	0.62	3.0 U
PB	Silver	0.5	0.0023	0.015	MH35G7	0.38	1.4 U
					MH35G8	0.48	0.64 U
					MH35H1	1.4	1.6 U
					MH35H8	0.29	1.7 U
					MH35H9	0.88	1.5 U
					MH35J2	0.84	1.5 U
					MH35J3	0.56	1.7 U
PB	Sodium	500	0.73	17.117	MH35G5	26.2	627 U
					MH35G6	72.1	795 U
					MH35G7	53.5	1380 U
					MH35G8	72.2	640 U
					MH35G9	38.4	1500 U
					MH35H0	33.9	1120 U
					MH35H1	44.5	1580 U
					MH35H2	53.0	1370 U
					MH35H3	20.8	638 U
					MH35H4	73.1	1410 U
					MH35H5	102	1100 U
					MH35H6	78.6	1370 U
					MH35H8	141	1680 U
					MH35H9	28.6	1460 U
					MH35J0	25.2	825 U
					MH35J1	90.9	1510 U
					MH35J2	30.5	1530 U
					MH35J3	88.4	1740 U
					MH35J4	77.9	640 U
					MH35J5	81.2	605 U
PB	Thallium	0.5	0.0015	0.500	MH35G5	0.45	0.63 U
					MH35G6	0.64	0.79 U
					MH35G7	0.12	1.4 U
					MH35G8	0.31	0.64 U
					MH35G9	0.19	1.5 U
					MH35H0	0.11	1.1 U
					MH35H1	0.77	1.6 U
					MH35H2	0.33	1.4 U
					MH35H3	0.23	0.64 U
					MH35H4	0.33	1.4 U
					MH35H5	0.61	1.1 U
					MH35H6	0.41	1.4 U
					MH35H8	0.070	1.7 U
					MH35H9	0.017	1.5 U
					MH35J0	0.39	0.83 U
					MH35J1	0.31	1.5 U
					MH35J2	0.25	1.5 U
					MH35J3	0.50	1.7 U
					MH35J4	0.31	0.64 U
					MH35J5	0.33	0.60 U

4. INDUCTIVELY COUPLED PLASMA - INTERFERENCE CHECK SAMPLE (ICP-ICS)

The ICP interference check sample (ICS) was run at the beginning and end of each sample analysis run and every 20 analytical samples, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within \pm the CRQL.

Yes No X

Comments: For Sodium, the ICP-AES Interference Check Sample Results exceeded the True Values by approximately 2.0 times the CRQL, this analysis was repeated with similar results. Results for all samples for Sodium analyses, have already been flagged 'U' due to blank contamination therefore no further qualification is applied due to the ICP-AES ICS result.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values or no interference was noted.

Yes X No NA

Comments: None.

Sample results contain potential false positives and false negatives.

Yes X No

Comments: The following table lists the elements with potential false positives or false negatives that resulted in sample qualification, affected samples, and data qualifiers:

ICP Interferences

Element	Concentration Found in ICSA Sample (ug/l)	Affected Samples	Concentration Found in Sample (mg/Kg)	Qualifier/ Adjustment
Beryllium	0.36	MH35G8 MH35J0	>MDL	J+
Potassium	494	MH35G6 MH35G8 MH35H5 MH35J4 MH35J5		
Thallium	-0.05	All samples	All concentrations	UJ

5. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No

Comments: None.

All results were within control limits OF 70-130%.

Yes X No

Comments: None.

6. FORM 6 & 12 - DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No NA

Comments: None.

The RPDs were calculated correctly.

Yes X No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were within 20% (limits of 35% apply for soil/sediments/tailings samples).

Yes X No NA

Comments: None.

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of CRQL (absolute difference < CRQL for soils).

Yes X No NA

Comments: None.

7. SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No NA

Comments: None.

The percent recoveries (%Rs) were calculated correctly.

Yes X No NA

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes No X

Comments: The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Antimony	12%	84%	All samples	I/UJ
Selenium	60%	63%		I-/UJ
Silver	6%	85%		I/UJ
Zinc	40%	68%		I-/UJ

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes X No NA

Comments: None.

8. ICP SERIAL DILUTION

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes X No

Comments: None.

The serial dilution was without interference problems as defined by the SOW.

Yes No X

Comments: The following serial dilution %Ds were greater than 10% and the original sample result was at least 50* the MDL:

Element	% Difference	Samples Affected	Qualifiers
Arsenic	22%	All samples	J
Beryllium	28%		
Cadmium	13%		
Chromium	12%		
Copper	21%		
Manganese	12%		
Nickel	90%		
Zinc	34%		

9. ICP-MS

The ICP MS tune met SOW requirements.

Yes X No NA

Comments: The ICP MS instrument was correctly tuned prior to analysis and all tuning criteria were met.

The minimum number of internal standards were added to the analyses and bracketed the target analyte masses.

Yes X No

Comments: None.

All percent relative intensities were within 60-125%.

Yes X No

Comments: None.

10. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

Yes No NA X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA/QC.

11. FORM 10 - INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes X No

Comments: None.

12. FORM 12 - PREPARATION LOG

Information on the preparation of samples for analysis was reported on Form 12.

Yes X No

Comments: None.